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STATE OF VERMONT IMPLEMENTATION PLAN FOR THE ACHIEVEMENT OF NATIONAL AIR QUALITY STANDARDS

Richard Valentinetti

Vermont State Agency of Environmental
Conservation

Prepared for:

Research Corporation of New England
Environmental Protective Agency

November 1971

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STATE OF VERMONT
IMPLEMENTATION PLAN
FOR THE ACHIEVEMENT OF
NATIONAL AIR QUALITY STANDARDS

Richard Valentinetti
Air Pollution Control Officer

November 1971

Robert B. Williams
Secretary
Agency of Environmental Conservation

Vermont Implementation Plan

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Vermont Implementation Plan

1.0 INTRODUCTION

The basic purpose of this plan is to meet national ambient air quality standards and to make significant progress towards achieving State air quality standards, which in some cases, are more stringent than the federal standards. However, this plan is not designed solely to meet air quality standards, but to protect the present air quality of Vermont which is superior to that stipulated in the national standards in many areas of the State. The air of Vermont is a precious resource, and the State realizes that it is in the unique position to abate this problem before the symptomatic effects are demonstrated.

This plan is prepared to meet the rules and regulations of the Environmental Protection Agency (EPA), specifically Title 42 Code of Federal Regulations - Public Health Chapter IV - Environmental Protection Agency, Part 420 - Requirements for Preparation, Adoption, and Submittal of Implementation Plans (August 14, 1971).

On April 30, 1971 pursuant to section 109 of the Clean Air Act, as amended, the Administrator of EPA promulgated national standards for sulfur oxides, particulate matter, carbon monoxide, photochemical oxidants, hydrocarbons, and nitrogen dioxide. Each State is required by section 110 of the Clean Air Act to adopt and submit to the Administrator of EPA a plan which provides for the implementation, maintenance, and enforcement of such national ambient air quality standards within each air quality control region (or portion thereof) within the State. The plan is to be submitted no later than 30 January 1972.

Existing Vermont regulations are adequate to ensure that all regions

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Existing Vermont regulations are adequate to ensure that all regions

in the State will have achieved and will maintain national secondary air quality standards by 1 January 1975. Even though existing regulations are judged to be adequate, this implementation plan is a dynamic entity and may be revised from time to time in accordance with the provisions of Paragraph 420.6, Title 42, Code of Federal Regulations.

This plan was prepared by the State of Vermont with the assistance of TRC - the Research Corporation of New England. TRC assistance was provided under Environmental Protection Agency Contract No. 68-02-0047, Task Order 5.

2.0 LEGAL AUTHORITY

Legal authority needed for the implementation of a program to attain, maintain and enforce the national ambient air quality standards includes establishing an Air Pollution Control Agency, granting the Agency necessary regulatory authority and granting authority to other State agencies for specific functions complementing those functions of the Air Pollution Control Agency.

2.1 General

It is general principle of law that a legislative grant of power is coupled with a reasonable authority to employ the necessary means to execute the power. With respect to implementation plans, the Clean Air Act requires that the plan include authority by the State to:

(1) Adopt emission standards and limitations and any other measures necessary for attainment and maintenance of national standards.

(2) Enforce applicable laws, regulations and standards, and seek injunctive relief.

(3) Abate pollutant emissions on an emergency basis to prevent substantial endangerment to the health of persons, i.e., authority comparable to that available to the Administrator under Section 303 of the Act.

(4) Prevent construction, modification, or operation of any stationary source at any location where emissions from such source will prevent the attainment or maintenance of a national standard.

(5) Obtain information necessary to determine whether air

pollution sources are in compliance with applicable laws, regulations, and standards, including authority to require record-keeping and to make inspections and conduct tests of air pollution sources.

(6) Require owners or operators of stationary sources to install, maintain, and use emission monitoring devices and to make periodic reports to the State on the nature and amounts of emissions from such stationary sources; also authority for the State to make such data available to the public as reported and as correlated with any applicable emission standards or limitations.

(7) When necessary to attain and maintain national air quality standards, authority to adopt land use and transportation controls is required.

Delegation of power to city (county) agencies is allowed. Also, to attain, maintain and enforce national ambient air quality standards, a function can be assigned by statute to a separate agency. The State does not contemplate delegating its responsibility to local agencies though permitted to do so by Vermont statutes. In the event that such delegation is made, the State still retains responsibility for carrying out this plan and may act within the area under delegation to ensure compliance with State laws and regulations.

Criteria to be applied to the statutes include an assessment of whether the law is sufficiently broad to enable the agency to protect welfare and injury to property as well as health. Also, under the definition of air pollution, the agency must be able to control and prevent conditions which threaten or endanger the public health or welfare, before the occurrence of actual injury.

The criteria must include the power to hold public hearings, gain access to records relating to emissions of air contaminants and secure necessary technical information. The Clean Air Act requires that the emergency authority exists to eliminate emissions from both stationary and moving sources, and to empower expeditious action, either judicial or administrative, during pending emergency conditions.

2.2 Formation of the Vermont Pollution Control Agency and Definition of Air Pollution

The Vermont Pollution Control Agency was created by an act of the State Legislature effective July 1, 1968. Title 10, Vermont Statutes Annotated, Chapter XVI, Numbers 351 to 370, established the agency, defined its basic structure, powers and duties (Appendix A).

2.3 Legal Authority of the State of Vermont

A letter from the Secretary, Agency of Environmental Conservation to the Administrator, Federal Environmental Protection Agency, is included in this section. This letter outlines the legal authority of the State as it relates to the Federal Clean Air Act, as amended. The Attorney General concurs with this description of the legal authority of the State to carry out the air quality control implementation plan.

Following the letter, Table 2.1 shows a summary of the status of legal authority for Vermont.

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TEL. 802-223-2311, EXT. 432

October 20, 1971

Honorable Robert B. Williams
Secretary, Agency of Environmental Conservation
Montpelier, Vermont

Dear Bob:

I have reviewed your letter addressed to Mr. William D. Ruckelshaus, Director of the Environmental Protection Agency, with its statement of legal authority to carry out Vermont's air quality control plan.

I have no suggestions for changes and I have approved the letter in the space provided and sent it along to Mr. Ruckelshaus.

Very truly yours,

Attorney General

JMJ:h

State of Vermont

AGENCY OF ENVIRONMENTAL CONSERVATION
Montpelier, Vermont 05602
OFFICE OF THE SECRETARY

epartment of Fish and Game
epartment of Forests and Parks
epartment of Water Resources
Environmental Board
Division of Environmental Protection
vision of Recreation
teragency Committee on Natural Resources
Natural Resources Conservation Council

October 4, 1971

Mr. William D. Ruckelshaus
Director
Environmental Protection Agency
Washington, D. C.

RE: Review of Legal Authority
Title 10, Chapter 15
Vermont Statutes Annotated (1968)

Dear Mr. Ruckelshaus:

I herewith submit the following statement of legal authority to carry out Vermont's air quality control plan as required under §420.11 of the Rules and Regulations of the Environmental Protection Agency published in the Federal Register, Volume 36, No. 158, Saturday, August 14, 1971. At present statutory authority is derived from three separate acts: 10 V.S.A. Chapter 15 (Air Pollution Control), 3 V.S.A. §2822 (Agency of Environmental Conservation) 10 V.S.A. Chapter 151 (Land Use and Development Control). Amendments to the basic Air Pollution Control Act, will be introduced in the upcoming legislative session which will consolidate all legal controls into a single act. Copies of all relevant laws and regulations are attached. However, it is believed that current legislative authority fully meets federal requirements.

* * * * * * * * * * *

ESSENTIAL PROVISIONS:

1. Broad policy or definition of air pollution consistent with the Clean Air Act, as amended to protect and enhance air quality.

STATUS:

10 V.S.A. §351 contains a broad statement of public policy. Proposed amendment expands statement to include "to assure that adverse effects upon the environment are fully considered and borne by those who cause them."

ESSENTIAL PROVISIONS:

2. Authority to adopt rules and regulations including emission limitations on all sources.

STATUS:

10 V.S.A. §354 (2), (11), and §355 and §358 empowers the State Board of Health to adopt rules to implement the Air Pollution Control Act including emission limitations. Proposed amendments to §354 (11) and §358 transfers rule making power to the Secretary of Agency of Environmental Conservation and clarifies authority with regard to establishing ambient air quality and emission standards.

ESSENTIAL PROVISIONS:

3. Authority to require information relevant to air pollution control including authority to require periodic reports of emission information.

STATUS:

10 V.S.A., §355 explicitly empowers the Board of Health to require submission of periodic reports. Proposed amendments transfer this authority to the Secretary of the Agency of Environmental Conservation.

ESSENTIAL PROVISIONS:

4. Authority to provide that emission reports be available for public inspection.

STATUS:

10 V.S.A., §363 gives limited disclosure by Board of Health of confidential information but permits use analysis of general atmospheric conditions so long as confidential information on owners or operators are not identified. Proposed amendments to §363 only require confidentially of information certified to by the owner or operator under certain criteria but expressly provides that all other information will be of public record.

ESSENTIAL PROVISIONS:

5. Authority to require installation of equipment by owner or operator of stationary sources to monitor emissions and to conduct source tests.

STATUS:

Vermont Health Regulations, Part 5, Chapter 4, 5-483 and 5-484 authorizes the state to require installation of emission monitoring equipment and source tests. A new source subject to Chapter 151 of Title 10 (Land Use and Development Control Act) installation may be required as a condition of permit. Also for existing sources agreement by individual to provide for test or monitoring equipment may be required as a condition of accepting an assurance of discontinuance under 3 V.S.A. §2822. Proposed amendment to 10 V.S.A. §357 specifically authorizes requiring such equipment under agency inspection powers.

ESSENTIAL PROVISIONS:

6. Authority to prevent construction or modification of new sources including prior review of location and compliance with appropriate rules and regulations. (Basically a permit to construct system).

STATUS:

10 V.S.A. §356 authorizes the Board of Health to require by rule that notice be given before construction of a new air contaminate source and subsequent submission of plans. The Board has not adopted implementation rules at this time. Proposed amendments to §356 specifically require permits. Also all significant new emission sources must receive a development permit under Chapter 151 of Title 10 under which air pollution controls may be required as a permit condition.

ESSENTIAL PROVISIONS:

7. Authority to inspect emission sources.

STATUS:

10 V.S.A. §357 empowers inspection and testing of emission sources. Proposed amendments vests this authority in the Secretary of the Agency of Environmental Conservation.

ESSENTIAL PROVISIONS:

8. Authority to test emission sources.

STATUS:

See No. 5 above.

ESSENTIAL PROVISIONS:

9. Authority to issue appropriate orders to compel compliance with regulations.

STATUS:

10 V.S.A. §356 and §359 empowers the Board to issue enforcement orders. Proposed amendments vests this authority in the Secretary of the Agency of Environmental Conservation.

ESSENTIAL PROVISIONS:

10. Provision for adequate civil or criminal penalties.

STATUS:

10 V.S.A. §367 provides for penalties up to $2,000 - 3 V.S.A. §2822 authorizes civil penalties of not less than $100 and not more than $10,000 for each day an order of a court is violated. Proposed amendments to 10 V.S.A. §367 provide for fines not to exceed $5,000 and/or imprisonment up to 5 years; each day of violation is a separate offense.

ESSENTIAL PROVISIONS:

11. Provision for injunctive relief in the event other legal remedies fail to abate violation.

STATUS:

10 V.S.A. §2822, empowers the Secretary of the Agency of Environmental Conservation to obtain injunctive relief against violators. Proposed amendments to 10 V.S.A. §359 also vest this authority in the Secretary.

ESSENTIAL PROVISIONS:

12. Authority to implement emergency action comparable to section 303 of the Clean Air Act as amended.

STATUS:

10 V.S.A. §360 empowers the Board of Health to implement emergency provisions and procedures. Proposed amendment transfers this authority to the Secretary of the Agency of Environmental Conservation.

ESSENTIAL PROVISIONS:

13. Authority (to the extent necessary to achieve and maintain National air quality standards) to adopt land use and transportation control.

STATUS:

State has no air pollution problems requiring at this time land use and transportation control. 10 V.S.A. §6086 authorizes state to evaluate future development including highways in terms of air pollution. 10 V.S.A. §6042, §6043 mandates state to promulgate a state land use plan which may include air pollution consideration.

ESSENTIAL PROVISIONS:

14. Authority (to the extent necessary and practicable) for periodic inspection and testing of motor vehicles to enforce compliance with applicable emission standards.

STATUS:

10 V.S.A. §366 empowers the State Board of Health to provide for installation and testing of motor vehicles in conjunction with motor vehicle department. Proposed amendment transfers this authority to the Secretary of the Agency of Environmental Conservation.

ESSENTIAL PROVISIONS:

15. Authority as appropriate to regulate and coordinate local programs that are included in implementation plans.

STATUS:

10 V.S.A., §364 provides for local control programs as approved by the Board of Health. Proposed amendments transfer this authority to the Secretary of the Agency of Environmental Conservation.

* * * * * * * * * * *

I trust that this information meets the requirements of your regulation. Please feel free to contact me if you need anything further.

Yours very truly,

Robert B. Williams

ROBERT B. WILLIAMS, Secretary for
Environmental Conservation

RBW:sj:mss

APPROVED:

____
Attorney General

TABLE 2.1

SUMMARY OF STATUS OF LEGAL AUTHORITY FOR VERMONT

42 CFR Part 420 § 420.11		State Statute Section or Regulation	COMMENT
(a)(1)	Adopt Regulations.	351(a)&(c), 352(2), 354(2), (5), (11) 358	Adequate.
(a)(2)	Enforce Regulations (inc. injunctive relief).	359, 354(4), 367	Adequate.
(a)(3)	Abate Emergency Episodes.	360	Adequate.
(a)(4)	Prevent construction of new sources (inc. authority for prior review).	356	Adequate, though the definition of "modification" in 356(c) should mirror § 111(a)(4) of the Clean Air Act. As presently stated, the administrative procedures appear to be cumbersome.
(a)(5)	Obtain information:		
	Inspect sources	357	Adequate.
	Test sources	Reg. 5-483	Adequate.
	Record-keeping	Reg. 5-484	Adequate.
(a)(6)	Monitor Sources:		
	Require emission monitors	Reg. 5-484	Adequate.
	Require periodic reports	354(16) 355	Adequate.
	Correlate and make public emission data		Given 363 this authority is inadequate.

3.0 DESCRIPTION OF THE STATE

The Environmental Protection Agency has designated two air quality control regions in the State of Vermont. Region 159 is an interstate region containing Addison, Chittenden, Franklin, Grand Isle, and Rutland Counties in Vermont, and Clinton and Essex County in New York. This area encompasses the Champlain Valley. The second region designated for Vermont is Air Quality Control Region 221 which covers.the remainder of the State.

Lake Champlain extends for about 100 miles in a north-south direction, and defines the western border of Vermont along most of its length. It is about 12 miles wide at Burlington and less than 1 mile wide at the southern end. The largest population center along the lake is Burlington, Vermont with about 40,000 residents. The Champlain valley has the same north-south orientation as the lake. The valley is generally 40 to 50 miles wide and extends for more than 100 miles north and south. The northern end of the valley leads into the plains of the Montreal area. The southern end of the Champlain valley connects with the valley formed by Lake George, which in turn connects to the Hudson River valley, extending all the way south to New York City. Thus, although Lake Champlain flows north and the Hudson River flows south, the valleys formed by these two watersheds create what is essentially a single trench extending from the Montreal area to New York City. The Green Mountains shown in Fig. 3.1 define the eastern border of the Champlain valley. The figure shows a topographic map of the State of Vermont and the general north-south orientation of the mountains and valleys that divide the State.

About 45% of Vermont's population resides in the Champlain valley basin even though the basin contains about 25% of the State's land area. The

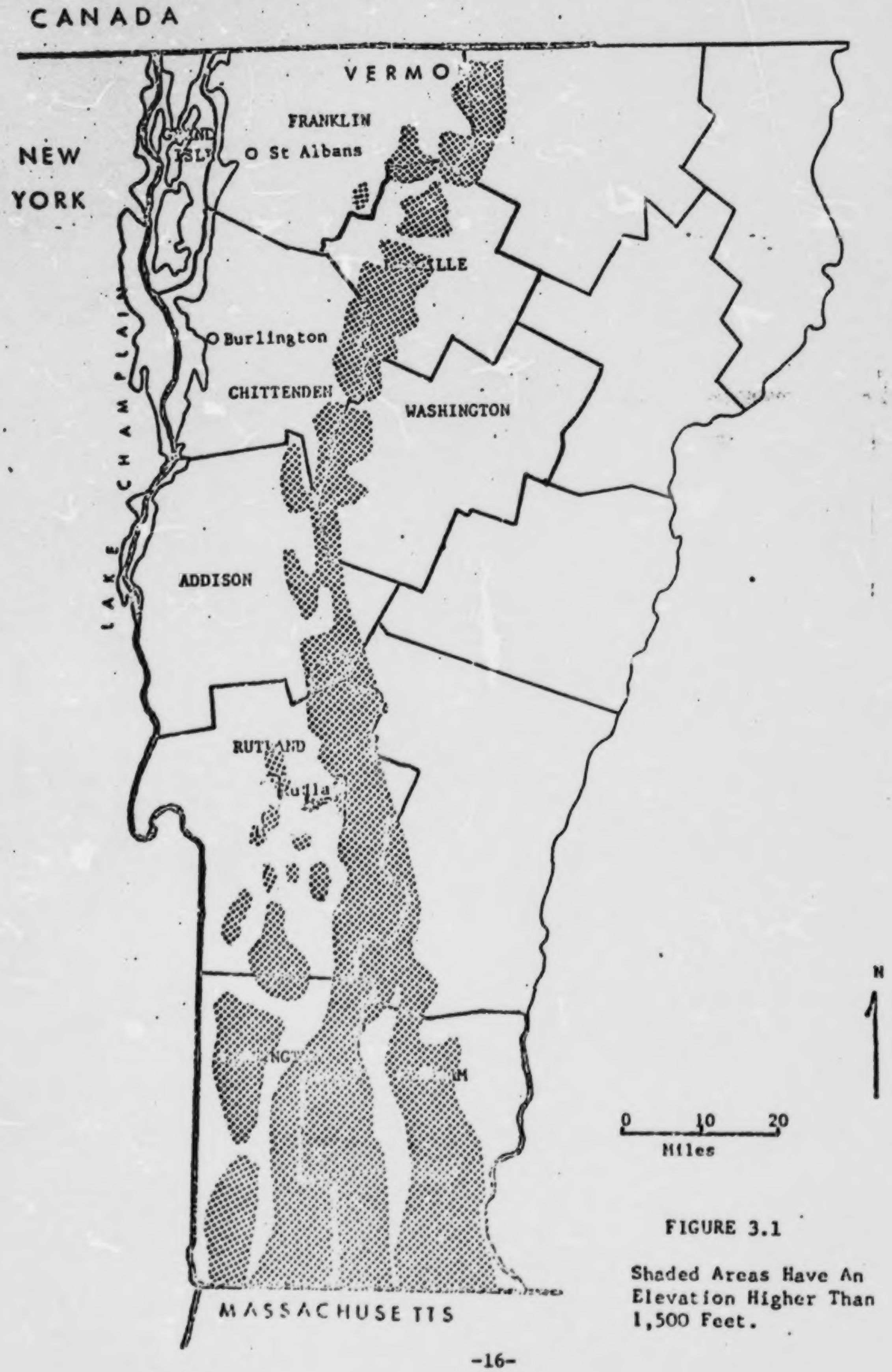

CANADA
VERMO
FRANKLIN
GRAND ISLE
St Albans
NEW YORK
LAKE CHAMPLAIN
ILLE
Burlington
CHITTENDEN
WASHINGTON
ADDISON
RUTLAND
Rutla
M
MASSACHUSETTS
N
0 10 20
Miles

FIGURE 3.1

Shaded Areas Have An Elevation Higher Than 1,500 Feet.

largest urban center in the basin is Burlington which has approximately 40,000 residents within the city limits and another 30,000 in surrounding areas. Rutland and St. Albans are smaller urban areas with approximately 20,000 residents and 10,000 residents, respectively. Outside of Burlington, Rutland, and St. Albans most of the land within the Champlain valley is sparsely populated. Both State and county population projections indicated a large potential for urban growth in the five counties which constitute the Champlain valley. A recent report on the New England economy prepared by Arthur D. Little and Company entitled New England: An Economic Analysis projected a 52% increase in population from 1967 to 1980 of the four northern-most counties of the study area, compared to a 30% increase estimated by the county planning commissions. The Regional Economics Division of the U. S. Department of Commerce predicts a 31% increase in population in this area by 1980.

In Air Quality Control Region 221 the primary centers of population are in the Montpelier-Barre area and in the vicinity of Brattleboro. Fig. 3.2 illustrates the population distribution in Vermont according to the 1960 Census. The eastern half of the State which constitutes the majority of this air quality control region is sparsely populated, although the trend towards increase in population is indicated by Fig. 3.3, which shows the urban development patterns if present trends continue by 1975, according to the Central Planning Office of Vermont. Opening of Interstate Routes 91 and 89 and the fact that they intersect at White River Junction should promote the population growth predicted by the Central Planning Office in this area.

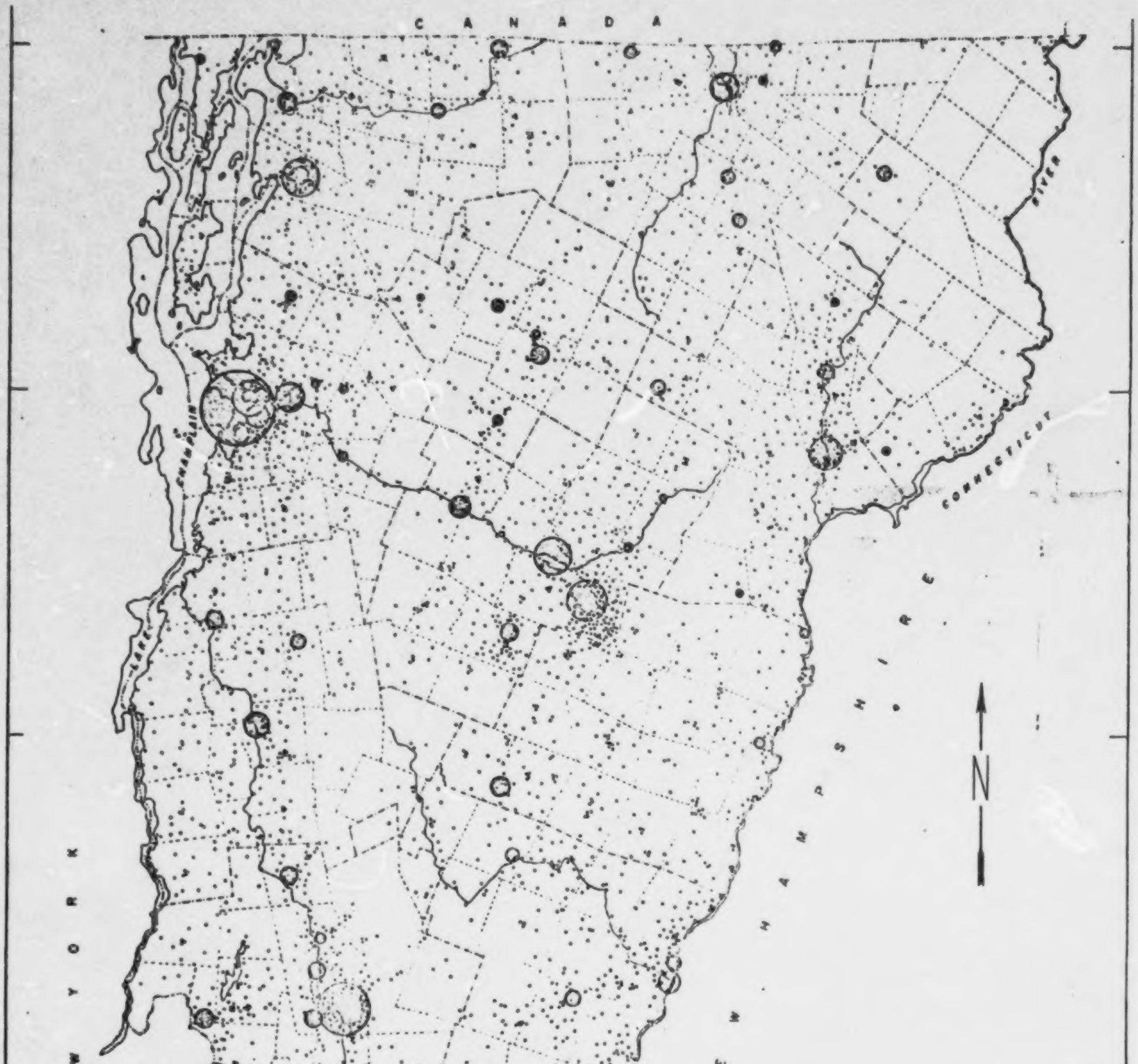

CANADA
NEW YORK
NEW HAMPSHIRE
MASSACHUSETTS
LAKE CHAMPLAIN
CONNECTICUT RIVER
CONNECTICUT RIVER
N
SCALE
MILES

FIGURE 3.2
VERMONT
POPULATION
1960

Reproduced from best available copy.

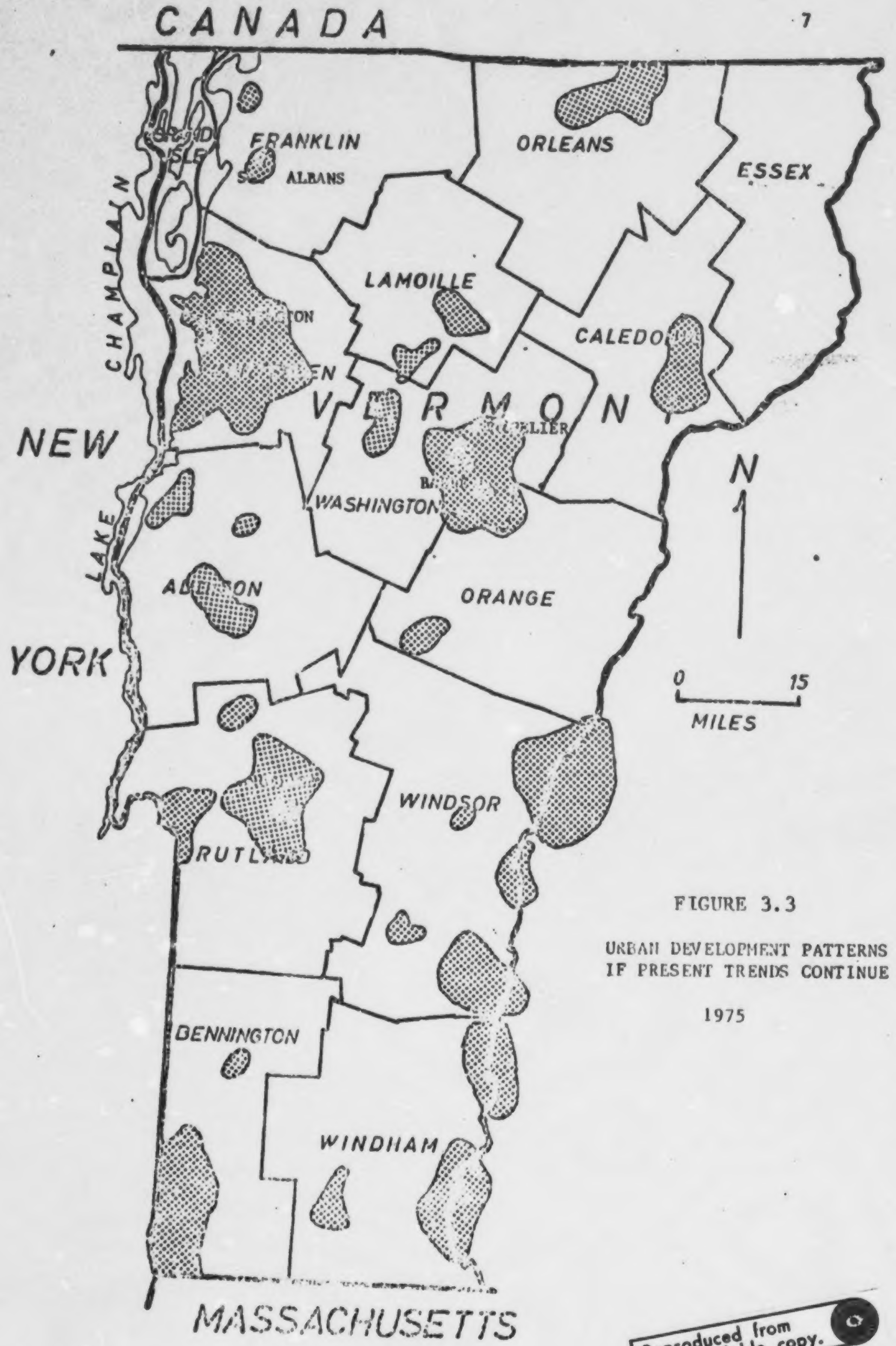

CANADA
7
FRANKLIN
ST. ALBANS
ORLEANS
ESSEX
LAMOILLE
CALEDONIA
VERMONT
NEW
YORK
LAKE
CHAMPLAIN
WASHINGTON
ADDISON
ORANGE
N
0
15
MILES
WINDSOR
RUTLAND
BENNINGTON
WINDHAM
MASSACHUSETTS

FIGURE 3.3

URBAN DEVELOPMENT PATTERNS
IF PRESENT TRENDS CONTINUE

1975

Reproduced from best available copy.

3.1 Climatic Summary for the State of Vermont

Source Documents:
1. Local Climatological Data (1931-1960)
2. Monthly Climatological Data - New England, January 1968 - December 1970
3. Climate of the State of Vermont - December 1959
4. Climatic Summary of the United States - New Hampshire and Vermont - from the establishment of stations to 1930
5. Summary of Airways Observations

3.1.1 General Description

Vermont's climate is characterized by frequent changes in weather, both within each season and between the same seasons in different years, large ranges in temperature, both daily and annual, and considerable difference from place to place. Vermont is situated in the zone of "prevailing westerlies", where the interaction between cold airmasses from the north and warm airmasses from the south produces low pressure storm systems and the frequent passage of warm and cold fronts. One principal storm track runs from the northern Great Lakes down the St. Lawrence valley, while another type of storm that affects the State, especially southern Vermont, is that which moves up along the east coast of the United States. Terrain plays a very important part in determining the effects of the various weather systems on Vermont.

The terrain ranges from hilly to mountainous. The Green Mountains run north and south the length of the State with the highest elevation being

Mt. Mansfield which is 4,393 ft. above sea level. Many peaks in this range rise to over 3,000 ft. as do several others in eastern Vermont. Elevations under 500 ft. are confined mostly to the lowlands around Lake Champlain in the northwest and a narrow strip of the lower Connecticut River valley which forms the eastern boundary of the state.

Dense fog is reported an average of 13 times/year at Burlington; 11 times at Concord, N.H.; and 32 times at Hartford, Conn. Annual sunshine at Burlington is 44%; Northfield, Vt. 46%; Albany, N.Y. 50%; and Concord, N.H. 53%.

3.1.2 Winds

If it were not for the mountains, winds would tend to be from the southwest in summer and northwest in winter. However, because of the rugged terrain, winds tend to parallel the valleys. The major valleys (Connecticut and Champlain) run in a north-south direction, while tributaries run from northwest to southeast. Thus, in most of the valleys, winds should tend to be from the north or northwest in winter and south or southeast in summer. Limited data from Burlington, however, shows that the prevailing direction is south during all months of the year. This may be due in part to the fact that Burlington, located in the Champlain valley in the northwestern part of the State, is affected mainly by the storms which traverse the St. Lawrence valley, bringing strong southerly winds ahead of them, while the cold outbreaks following the storms are accompanied by wind directions which are split between north, northwest and west.

Scattered data from other locations in Vermont are shown in Table 3.1, with no particular pattern evident.

Table 3.1

ANNUAL WIND DATA

Climatic Area	Location	Prevailing Direction	Ave. Speed (when reported)
Northeast	Enosburg Falls	NW	-
	Bloomfield	S	-
	Northfield	S	8.6 mph
Western	Burlington	S	1 - 7 mph
	Wells	SW	-
Southeast	Hanover	NW	-

PREVAILING LOW LEVEL WIND DIRECTION AT BURLINGTON

	Dec - Feb	Mar - May	Jul - Aug	Sep - Nov
500 meters	S SW	S	S	S
1000 meters	W NW	NW	W NW	W

In further discussing the variations in climate within Vermont, especially as it pertains to the stability of the air, mixing, and frequency of stagnation, it is necessary to split it into climatic zones. The most significant dividing line is the ridge of the Green Mountains. This is roughly the line used in the publication "Climate of the State of Vermont" to divide the State into the Western and Eastern zones. The Eastern zone is further divided into the Northeast and Southeast zones, a division which is less significant, except possibly in terms of temperature. (A list of reporting sites within each of these zones is shown elsewhere in this report.) Within each zone there is still considerable difference in weather and topography.

The major difference between the two major zones (Eastern and Western) is that warm fronts in connection with storms moving down the St. Lawrence valley very often reach the Western zone, but do not cross the mountains. This is particularly true of the Champlain valley where the warm fronts most often reach, causing southerly winds, and good mixing. Meanwhile, the area east of the Green Mountain ridge, including the remaining hilly and mountain areas eastward to the Connecticut River, remains in the cold air under the inversion. In this cold air there is likely to be low cloudiness, precipitation, and sometimes fog. This is particularly true of the Connecticut valley where the inversion usually persists until the next cold front arrives from the west. Thus the two major valleys in the State often have some of the greatest differences in weather during this type of weather event. In addition to warm front inversions with attending low clouds and fog, one other major characteristic of the Connecticut valley is the high incidence of radiation type inversions with light winds and groundfog. While this is well known to meteorologists, there is very little data available to substantiate it. One bit of evidence is that Lebanon, New Hampshire, just across the Connecticut River in this fog zone, reports winds of 3 mph and below 46% of the time, while Burlington, in the Champlain valley, only reports winds this light 8% of the time. Dense fog occurs in Burlington only 0.3% of the time. Other data from Burlington on amounts of cloudiness and visibilities are shown in Table 3.2. Another possible comparison between the two valleys is the number of days each year with dense fog. Burlington reports dense fog 13 days a year on the average, while at Hartford, Connecticut, further south in the Connecticut River valley, dense fog occurs 32 days a year. Because the river valley in Vermont is much narrower and deeper than at Hartford, we would expect a much higher incidence of dense early morning groundfog.

In general we expect that all of the region from the Green Mountains to the Connecticut River tends to have more fog and light wind conditions than the area west of the mountains. Much of the fog in the mountains themselves, except for the deeper valleys in the mountain region, is caused by low hanging clouds or warm advection occurring mainly with the passage of storm systems from the south or west. Cold outbreaks with a trajectory across the Great Lakes also cause low clouds, snow flurries, and some fog over the mountains, but moderate to strong winds and unstable air in these cases allows good mixing.

In regards to "Mean Maximum Mixing Depths", Inversion, and Stagnation frequencies, Holzworth (1964) shows that Vermont lies in the region of relatively low "MMD's". However, Inversion frequencies (Hosler 1961) are mostly below average. The distribution of stagnation cases and days (Korshover 1967) shows that Vermont has a rather low number, especially when compared with the southeastern states. Between 1936 and 1945, there were between 15

Table 3.2

FREQUENCY OF SELECTED PHENOMENA BY SEASON, Burlington (BTV) & Albany NY (ALB)

		Dec - Feb		Mar - May		Jun - Aug		Sep - Nov	
		BTV	ALB	BTV	ALB	BTV	ALB	BTV	ALB
Fog	Light-Mod	9.2%	13.1%	11.8%	7.8%	6.3%	8.1%	10.0%	11.4%
	Dense	0.8	0.7	0.4	0.3	0.0	0.5	0.1	1.4
Ceiling	0 - 300'	2.5%	2.9%	1.6%	1.1%	0.3%	0.8%	1.8%	1.8%
	300 - 600'	5.0	4.1	3.2	2.4	1.4	1.4	2.9	2.7
	600 - 1000'	6.4	4.3	4.5	m	2.2	m	3.9	m
	1000 - 2000'	11.8	10.4	6.8	m	4.2	m	9.8	m
Visibility	0 - 1/2	3.2%	4.0%	3.1%	m	0.0%	1.1%	1.3%	2.9%
	1/2 - 1	4.2	4.5	1.7	m	0.4	2.9	1.6	3.0
	1 - 2	5.1	9.9	5.3	4.9	2.7	5.1	2.4	7.9
	2 - 6	14.2	31.3	7.9	24.5	14.8	31.0	16.2	32.3
Wind	Calm - 3	5.0%	17.0%	13.0%	15.0%	8.0%	22.0%	5.0%	21.0%
	4 - 15	75.0	60.0	73.0	61.0	84.0	69.0	76.0	65.0

and 40 stagnation days in Vermont compared to 400 for northern Georgia.

3.1.3 Temperature

Comparisons were made of both the 30 year (1931-1960) average temperatures, and the 3 year (1968-1970) average temperatures for Burlington and the three climatic areas. Selected monthly summaries and comparisons are included in Table 3.3. Fig. 3.4 depicts the comparison of the 30 year monthly mean average temperature (dashed line), to the 1968-1970 mean average (solid line).

The 30 year mean annual temperature is 43.9°. The 3 year mean annual temperature is 43.2°. One of the most interesting results of our study was recognizing the rapid change in average monthly temperatures as winter approaches and leaves the State. The average temperature drops 13.6° between November and December (36.2° to 22.6°). During March-April, the increase is 13.3° (29.1° to 42.4°). Both of these changes are significantly greater than for the same months at Hartford.

Detailed daily maximum-minimum temperature information was obtained from the 26 reporting sites (Table 3.4) for the period 1 Jan 68 - 31 Dec 70. The observing sites are manned by volunteers, and are a part of the U.S. Weather Bureau Cooperative Observer Program.

Thirty year annual temperature variations for each of the three geographic areas are listed in Table 3.5. In every month other than July, the Western sector has the highest average temperature, while the Northeastern sector has the lowest average temperature. This evidence of "different" weather affecting the state is more thoroughly discussed in the General Climatology section of this report.

Table 3.3

TEMPERATURE RECORDS

	BURLINGTON	N'EAST	WEST	S'EAST	MEAN
JANUARY					
AVERAGE (68-70)	9.5	9.3	13.4	13.9	11.5
MAXIMUM "	43.	49.	50.	50.	48.0
MINIMUM "	-27.	-36.	-29.	-32.	-31.0
AVERAGE (30 YR)	17.9	16.3	20.3	19.1	18.4
MAXIMUM "	63.				
MINIMUM "	-30.				
FEBRUARY					
AVERAGE (68-70)	15.5	16.0	19.5	20.1	17.8
MAXIMUM "	46.	55.	57.	49.	51.8
MINIMUM "	-19.	-25.	-19.	-16.	-19.8
AVERAGE (30 YR)	18.1	17.6	21.6	19.8	19.3
MAXIMUM "	60.				
MINIMUM "	-26.				
MARCH					
AVERAGE (68-70)	26.6	27.7	30.4	30.2	28.7
MAXIMUM "	67.	70.	75.	69.	70.3
MINIMUM "	-13.	-23.	-21.	-16.	-18.2
AVERAGE (30 YR)	29.3	27.4	30.8	29.0	29.1
MAXIMUM "	84.				
MINIMUM "	-20.				
APRIL					
AVERAGE (68-70)	43.8	43.2	46.6	45.9	44.9
MAXIMUM "	84.	83.	84.	88.	84.8
MINIMUM "	6.	-2.	10.	4.	4.5
AVERAGE (30 YR)	42.3	41.0	44.2	42.1	42.4
MAXIMUM "	84.				
MINIMUM "	9.				

Table 3.3 (cont.)

	BURLINGTON	N'EAST	WEST	S'EAST	MEAN
MAY					
AVERAGE (68-70)	52.4	52.3	54.3	54.2	53.3
MAXIMUM "	83.	88.	87.	92.	87.5
MINIMUM "	25.	20.	21.	24.	22.5
AVERAGE (30 YR)	55.5	53.5	56.1	54.0	54.8
MAXIMUM "	91.				
MINIMUM "	25				
JUNE					
AVERAGE (68-70)	62.9	61.8	64.5	62.9	63.0
MAXIMUM "	89.	93.	94.	95.	92.8
MINIMUM "	39.	31.	33.	34.	34.2
AVERAGE (30 YR)	65.5	62.7	65.1	63.1	64.1
MAXIMUM "	96.				
MINIMUM "	35.				
JULY					
AVERAGE (68-70)	69.0	69.8	67.2	68.4	68.6
MAXIMUM "	94.	95.	94.	97.	95.0
MINIMUM "	40.	38.	32.	34.	36.0
AVERAGE (30 YR)	70.4	69.7	67.2	67.5	68.7
MAXIMUM "	99.				
MINIMUM "	44.				
AUGUST					
AVERAGE (68-70)	66.9	65.2	68.2	66.3	66.7
MAXIMUM "	92.	92.	93.	95.	93.0
MINIMUM "	40.	30.	35.	32.	34.3
AVERAGE (30 YR)	68.1	65.1	67.6	65.4	66.6
MAXIMUM "	101.				
MINIMUM "	39.				

Table 3.3 (cont.)

	BURLINGTON	N'EAST	WEST	S'EAST	MEAN
SEPTEMBER					
AVERAGE (68-70)	59.7	58.9	61.1	60.5	60.1
MAXIMUM "	87.	89.	88.	92.	89.0
MINIMUM "	32.	27.	30.	30.	29.8
AVERAGE (30 YR)	59.9	57.4	60.0	57.8	58.8
MAXIMUM "	94.				
MINIMUM "	26.				
OCTOBER					
AVERAGE (68-70)	48.7	48.2	50.6	49.1	49.1
MAXIMUM "	80.	84.	83.	83.	82.5
MINIMUM "	20.	9.	20.	9.	14.5
AVERAGE (30 YR)	48.2	46.8	49.4	47.2	47.9
MAXIMUM "	85.				
MINIMUM "	21.				
NOVEMBER					
AVERAGE (68-70)	35.6	34.1	37.6	36.6	36.0
MAXIMUM "	61.	63.	66.	66.	64.0
MINIMUM "	17.	5.	12.	7.	10.3
AVERAGE (30 YR)	36.4	34.9	37.8	35.8	36.2
MAXIMUM "	75.				
MINIMUM "	-2.				
DECEMBER					
AVERAGE (68-70)	16.9	17.3	20.2	21.0	18.9
MAXIMUM "	56.	59.	58.	63.	59.0
MINIMUM "	-23	-30	-23	-23	-24.8
AVERAGE (30 YR)	22.8	20.4	24.6	22.7	22.6
MAXIMUM "	62.				
MINIMUM "	-22.				

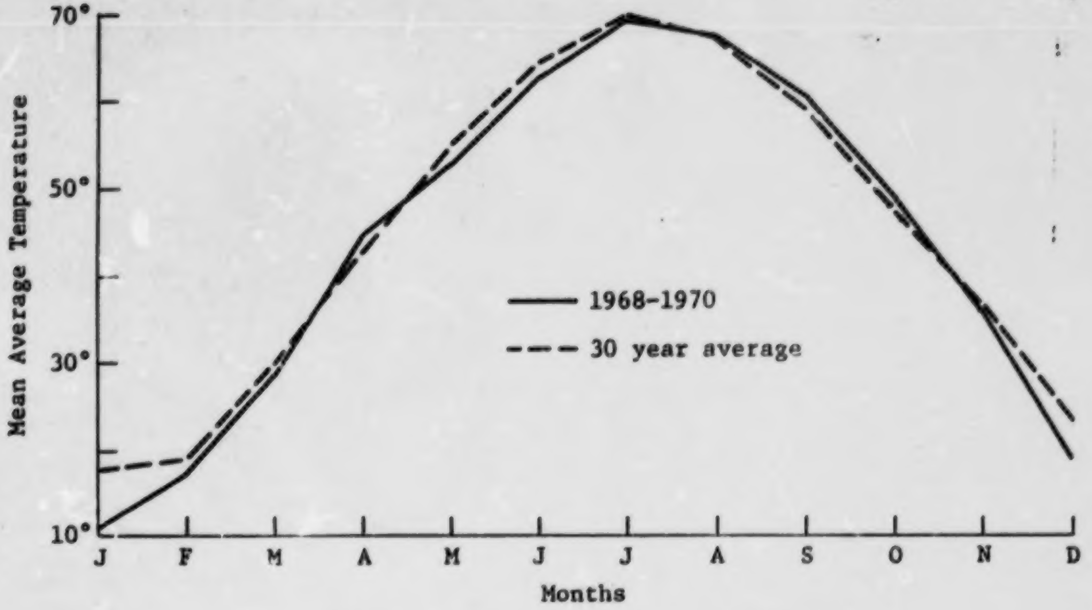


Fig. 3.4 Monthly mean temperatures.

Table 3.4

LIST OF COOPERATIVE WEATHER BUREAU OBSERVING STATIONS

NORTHEASTERN		WESTERN		SOUTHEAST	
SITE	ELEV	SITE	ELEV	SITE	ELEV
Chelsea	750	Bennington	670	Bald Mt. Dam	1130
Enosburg Falls	422	Bristol	500	Bellows Falls	300
McIndoe Falls	480	Burlington	332	Cavendish	800
Montpelier	1126	Cromwell	340	Readsboro	1120
Morrisville	680	Dorset	980	Vernon	225
Newport	766	Rutland	620	Woodstock	750
No. Danville	1140	St. Albans Bay	110		
Northfield	670	South Herd	110		
Rochester	830				
St. Johnsbury	699				
Waterbury	810				
West Burke	900				

Table 3.5

AVERAGE TEMPERATURES BY REGION OF STATE IN DEGREES F.

	N'east	West	S'east
Jan	16.3	20.3	19.1
Feb	17.6	21.6	19.8
Mar	27.4	30.8	29.0
Apr	41.0	44.2	42.1
May	53.5	56.1	54.0
Jun	62.7	65.1	63.1
Jul	69.7	67.2	67.5
Aug	65.1	67.6	67.5
Sep	57.4	60.0	57.8
Oct	46.8	49.4	47.2
Nov	34.9	37.8	35.8
Dec	20.4	24.6	22.7
Annual Average	42.7	45.4	43.6

3.1.4 Precipitation

Using the same source documents as for temperature studies, the following information was derived:

The 30 year mean annual precipitation was 36.61"

The 3 year mean annual precipitation was 37.33"

Fig. 3.5 compares the 1931-1960 and the 1968-1970 precipitation for the State of Vermont.

In August 1955, Burlington had 11.54 inches of rain. This appears to be the "all-time-high" for the State. For the rest of New England, the heaviest reported 24 hour precipitation was 18.15" at Westfield, Mass., and the heaviest monthly was 27.70" reported at Torrington, Conn. Both of these records also occurred in August 1955.

A review of the detailed reports for 1968-1970 shows the following average number of days when more than .10" of precipitation was reported by any one station in each of the climatic areas:

Jan	7	9	7
Feb	9	9	5
Mar	10	11	9
Apr	9	10	10
May	12	11	11
Jun	12	10	10
Jul	10	9	7
Aug	11	9	8
Sep	9	9	8
Oct	10	8	7
Nov	13	12	11
Dec	14	11	12
Annual	126	118	105

As can be seen from the above table and from the detailed precipitation information in Table 3.6, there is no clearly identifiable wet or dry season. This is typical for all of New England. The majority of winter precipitation is associated with low pressure or frontal storm systems, and, while their

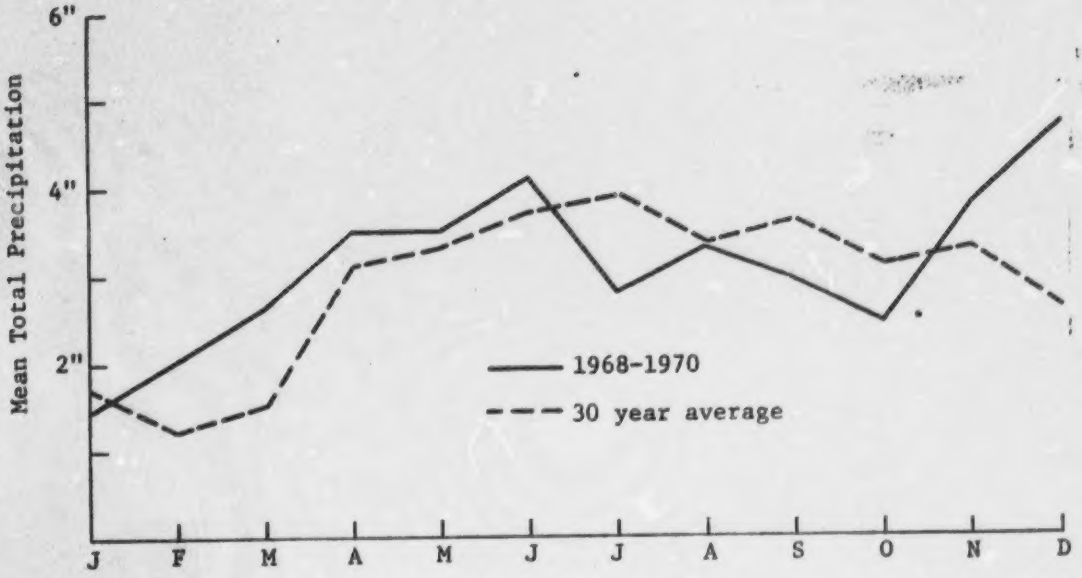


Fig. 3.5 Monthly mean precipitation.

Table 3.6

PRECIPITATION

	BURLINGTON	N'EAST	WEST	S'EAST	MEAN
JANUARY					
AVERAGE (68-70)	1.45	1.69	1.35	1.39	1.47
MAXIMUM "	2.43	2.57	1.91	1.90	2.20
MINIMUM "	.65	.77	.66	.71	.69
AVERAGE (30 YR)	1.89	2.48	2.53	3.64	2.64
MAXIMUM "	3.74				
MINIMUM "	.56				
FEBRUARY					
AVERAGE (68-70)	1.39	2.22	1.57	2.84	2.01
MAXIMUM "	1.95	2.85	1.82	3.75	2.59
MINIMUM "	.94	1.06	1.10	.84	.99
AVERAGE (30 YR)	1.58	2.19	2.12	3.00	2.22
MAXIMUM "	3.98				
MINIMUM "	.82				
MARCH					
AVERAGE (68-70)	2.39	2.42	2.47	3.28	2.64
MAXIMUM "	3.23	3.54	3.90	4.54	3.80
MINIMUM "	1.93	1.75	1.48	2.39	1.89
AVERAGE (30 YR)	2.19	2.44	2.63	2.73	2.50
MAXIMUM "	3.27				
MINIMUM "	.95				
APRIL					
AVERAGE (68-70)	3.24	3.25	3.82	3.95	3.56
MAXIMUM "	3.54	3.35	4.17	4.57	3.91
MINIMUM "	2.93	3.15	3.48	3.33	3.22
AVERAGE (30 YR)	2.63	2.98	3.05	3.88	3.14
MAXIMUM "	4.27				
MINIMUM "	1.39				

Table 3.6 (cont.)

	BURLINGTON	N'EAST	WEST	S'EAST	MEAN
MAY					
AVERAGE (68-70)	2.89	3.48	3.77	3.83	3.49
MAXIMUM "	3.14	4.05	4.36	4.78	4.08
MINIMUM "	2.43	3.17	3.38	2.85	2.96
AVERAGE (30 YR)	2.89	3.37	3.43	3.80	3.37
MAXIMUM "	5.90				
MINIMUM "	1.49				
JUNE					
AVERAGE (68-70)	4.02	3.85	3.56	4.77	4.05
MAXIMUM "	4.38	4.40	3.72	6.23	4.68
MINIMUM "	3.66	3.40	3.27	2.83	3.29
AVERAGE (30 YR)	3.57	3.83	3.73	3.89	3.76
MAXIMUM "	7.35				
MINIMUM "	1.09				
JULY					
AVERAGE (68-70)	2.34	3.07	3.19	2.80	2.85
MAXIMUM "	2.70	3.99	4.62	5.24	4.14
MINIMUM "	1.92	2.41	1.85	1.13	1.83
AVERAGE (30 YR)	3.75	3.86	3.95	4.08	3.91
MAXIMUM "	5.34				
MINIMUM "	1.29				
AUGUST					
AVERAGE (68-70)	3.17	3.50	3.61	3.12	3.35
MAXIMUM "	3.71	4.07	4.85	3.84	4.12
MINIMUM "	2.36	2.52	2.46	1.89	2.31
AVERAGE (30 YR)	3.01	3.37	3.67	3.36	3.35
MAXIMUM "	11.54				
MINIMUM "	.72				

Table 3.6 (cont.)

	BURLINGTON	N'EAST	WEST	S'EAST	MEAN
SEPTEMBER					
AVERAGE (68-70)	2.62	2.69	2.97	3.66	2.99
MAXIMUM "	3.93	3.84	4.26	4.86	4.22
MINIMUM "	1.88	1.82	2.13	2.16	2.00
AVERAGE (30 YR)	3.14	3.69	3.69	3.95	3.62
MAXIMUM "	8.18				
MINIMUM "	.87				
OCTOBER					
AVERAGE (68-70)	2.34	2.40	2.61	2.63	2.50
MAXIMUM "	2.73	2.82	3.07	2.90	2.88
MINIMUM "	1.62	2.10	2.16	2.44	2.08
AVERAGE (30 YR)	2.89	3.25	3.11	3.37	3.16
MAXIMUM "	6.22				
MINIMUM "	.88				
NOVEMBER					
AVERAGE (68-70)	3.36	3.60	3.56	4.80	3.83
MAXIMUM "	4.37	4.99	4.64	6.81	5.20
MINIMUM "	2.35	2.21	2.49	2.80	2.46
AVERAGE (30 YR)	2.85	3.25	3.15	4.09	3.34
MAXIMUM "	5.17				
MINIMUM "	.63				
DECEMBER					
AVERAGE (68-70)	3.83	4.78	4.15	5.59	4.59
MAXIMUM "	4.59	5.49	4.85	6.85	5.45
MINIMUM "	3.12	4.16	3.28	3.97	3.63
AVERAGE (30 YR)	1.88	2.58	2.44	3.50	2.60
MAXIMUM "	4.12				
MINIMUM "	.62				

summertime activity is reduced, thunderstorms account for the majority of the summer rains.

Annual average snowfall is from 55 to 65 inches, but amounts of up to 125 inches are not uncommon at the higher elevations. Our review of the available climatic data indicates significant variations in annual amounts, and vast differences by individual months. For example, the one-month record for snowfall at Burlington is 34.3" (Feb 58). A monthly snowfall of only 1.3" was reported there in February 1957.

The rapid increase in monthly mean temperatures between March and April (from 29.1° to 42.4°) causes rapid melting of the snow. This, coupled with the average April precipitation of 3.14", results in occasional spring flooding. Since the night-time temperatures are often below freezing, the run-off is gradual, but occasional ice jams cause some over-bank flooding. The full impact of the run-off from the hills and mountains of Vermont are more of a flooding problem to areas further south on the Connecticut River.

3.1.5 References

Holzworth, George C., 1964: Estimates of mean maximum mixing depths in the contiguous United States, Monthly Weather Review, 92, 235-242.

Hosler, Charles R., 1961: Low-level inversion frequency in the contiguous United States, Monthly Weather Review, 89, 319-332.

Korshover, Julius, 1967: Climatology of stagnating anticyclones east of the Rocky Mountains 1936-1965. Public Health Service Publication No. 999-AP-34, U.S. Department of Health, Education and Welfare.

4.0 CONTROL PLAN

4.1 Summary

4.1.1 Methodology

Vermont is divided into two air quality regions. Region 159 encompasses Addison, Chittenden, Franklin, Grand Isle and Rutland Counties. The remainder of the State is contained in Air Quality Control Region 221. The nature of Vermont is such that air quality and emissions of air pollutants have to be assessed on a small area by area basis. Villages are isolated from each other; they tend to be in valleys, separated by ridges. Hence, they generate their own local pollution and receive little from outside sources. Air quality in the open spaces is good and it is expected to remain satisfactory. For the purposes of examining the existing air quality, assessing current pollutant emissions, assessing the current regulations developed by the State of Vermont and determining how these regulations will affect air quality, we have examined five counties. These are Addison County, Chittenden County, and Rutland County from Air Quality Control Region 159, and Washington County and Windham County from Air Quality Control Region 221. Burlington is the largest population center and is found in Chittenden County. Rutland in Rutland County is the area of major concern there while Barre and Montpelier, both in Washington County, are areas of concern in that county. Brattleboro is the area of concern in Windham County.

Regions are classified as Priority I, II or III for purposes of plan development and evaluation. The requirements for control strategy evaluation are based on the Priority rating of the region and the plan is commensurate with the complexity of the air pollution problem. Priorities are based on Paragraph 420.3, Federal Register, Vol. 36, No. 158, August 14, 1971. Both regions are classified as Priority II for particulates and sulfur dioxide. Both regions have observed values of particulate levels that exceed 60 micrograms per cubic meter for an annual geometric mean, as shown in Table 4.6. Annual sulfur dioxide levels observed in each region were less than the Priority II level but the 24-hour maximum observed value exceeded the minimum; therefore, the regions must be classified Priority II in accordance with 420.3 a(1)(ii) of the Federal Register previously cited.

Both regions were classified Priority III for the secondary pollutants, carbon monoxide, nitrogen oxides, hydrocarbons and oxidants on the basis of both population and measured data. Priority III regions are areas where the pollutant concentration level is less than the minimum specified standard and no immediate problem exists. Again the observed levels of pollutant concentration observed in Burlington (Region 159) and Barre (Region 221) are shown in Table 4.6.

If regulations prove to be satisfactory for these areas, it is assumed they will be satisfactory for the less populated areas of the State. Urban development patterns predicted by the Vermont Central Planning Office indicate more growth around existing population centers than other areas with the exception of the area around White River Junction. The intersection of Interstate Routes 89 and 91 will contribute to the faster growth at White River Junction, but it is not expected to be as large as the other major urban centers.

Concentrations of contaminants from major point sources were examined utilizing the Gaussian plume model to calculate air quality in

Essex County and the southwestern section of Washington County. These calculations, in lieu of air quality data, indicate there is necessity for control and that the regulations will provide adequate control of emissions in these areas as well as the urban areas.

The background to be used for particulates for application of the proportional models to determine allowable emissions was chosen as 30 micrograms per cubic meter. For purposes of developing a control strategy, background concentration must be taken into account with respect to particulate matter. Background concentration is that portion of the measured ambient levels of particulate matter that cannot be reduced by controlling emissions from manmade sources. The background concentration was determined by reference to the measured ambient level of particulate matter in the rural area near Randolph. The annual background measured at Randolph was 32 micrograms per cubic meter. Equation (1) was used to calculate allowable emissions in the four counties of Chittenden, Washington, Windham, and Rutland. Since air quality data were not available from Addison County and the emissions from Addison County sources are low compared to the other counties, proportional modeling was not applied at this point. The reason for including Addison County is that a major point source is expected to be built there in the future.

Proportional modeling, described by equation (1), is a method employed to determine the emissions permitted to meet air quality standards when existing air quality and emissions are known. Specifically,

$$PE = \frac{CE \ (AQS - B)}{Max \ (AQ) - B} \tag{1}$$

where PE are the permissible emissions under the proportional modeling technique, CE are the current emissions in the area, B is the background concentration, AQS stands for the Air Quality Standard shown in Table 4.6a for the various pollutants of concern at this time, and Max (AQ) is the maximum measured annual air quality in the region under investigation.

4.1.2 Current Data

Air quality concentration data for total particulates were collected at Barre, Burlington, Brattleboro, and in Rutland. In addition, particulate air quality data were obtained at Randolph and Shoreham. Randolph was a rural location although it was affected by a dusty access road to a limited extent and was used for a background station to determine the basic air quality of a rural area.

Sulfur dioxide concentrations were obtained in Burlington and Barre. Carbon monoxide observations were obtained in the same places, although limited to only 4 months of the year at Barre, and 2 months at Burlington. Hydrocarbons were measured during a 3-month period in Barre and a 2-month period in Burlington. Nitrogen dioxide was measured in Burlington for a full year and in Barre for a 6-month period. In addition, ozone was measured at Burlington for 10 months and in Barre over a 4-month period. The ozone observations have some interference from nitrogen dioxide. Two months of observational data for ozone concentrations was obtained at Underhill in Chittenden County. The details of the observations of air quality are discussed in Section 4.2.1.

An emission inventory was prepared on the basis of questionnaires, traffic counts, population density and inspection for the State. In most cases it was prepared by county but in some areas the density of population indicated smaller divisions were required. Grid squares 5 kilometers on a side were examined in detail in the areas around Burlington, Rutland, Barre, Montpelier and Brattleboro. These areas are shown on the figures in Section 4.2 where density of emissions is discussed with reference to sampling location. In general the sampling locations were in areas of maximum emissions. Emission data were taken from the areas within 5 to 10 kilometers of the sampling point to develop emissions affecting the air quality for application of the proportional model (equation 1). The emissions consist of both the point source and area source emissions surrounding the sampling site. Emissions in each area are shown in Figures and Tables throughout Section 4.

4.1.3 Strategy Evaluation

4.1.3.1 Particulates

Particulate concentrations measured around the state varied from 32.1 to 96.5 micrograms per cubic meter for an annual geometric mean. Federal primary standards were exceeded in Rutland and secondary standards were exceeded in Burlington and Brattleboro. Therefore, a reduction or roll back of sources is required.

The proportional model is discussed in detail in Section 4.2.5. Calculations using the model for application to particulate air quality and emissions are summarized here. A background of 30 micrograms per cubic meter was selected from the data obtained at Randolph. The calculations for permissible emission rates for particulates in the four areas where observations of air quality and emissions are available are shown below.

Burlington $PE = \frac{60-30}{70.5-30} \quad 5854 = 4336$ Tons/year

Barre $PE = \frac{60-30}{55-30} \quad 416 = 416$ Tons/year

Brattleboro $PE = \frac{60-30}{60.4-30} \quad 347 = 342$ Tons/year

Rutland $PE = \frac{60-30}{96.5-30} \quad 1489 = 671$ Tons/year

Table 4.1 is an Emission Summary developed for particulates for the four areas used for proportional modeling for particulates. Calculations were actually performed for areas immediately around the observation sites, not for the whole county. The emissions are shown in Table 4.1 for the Burlington, Rutland, Barre, and Brattleboro areas. The first column contains the current emissions. The second column shows the emissions utilizing the optimum strategy applied to the 1970 inventory and the third column shows emissions projected to 1975. Allowable emissions calculated by equation (1) are shown below each table.

Point source emissions of course are those due to fuel combustion, incineration and process losses, while area source emissions are those from home and commercial heating and transportation. For particulates it is evident that the current strategy utilizing the State of Vermont regulations to limit particulate emissions, plus those Federal Regulations for vehicular emissions to be in effect by 1975, will meet the requirements for Air Quality as indicated by the proportional model. The Vermont Air Quality Standard that the State would like to achieve is 45 micrograms per cubic meter, significantly smaller than the National Secondary Standard. To achieve this clean air, the State will monitor progress towards the achievement of both national standards and the State goal and will revise its regulations accordingly.

The standard for 24-hour concentration of particulates is 150 micrograms

Table 4.1

Particulate Emission Summary - Barre, Washington County

Category	Current Emissions (T/yr)	Optimum Strategy Emissions (T/yr)	1975 Optimum Strategy Emissions (T/yr)
Point Source			
Fuel Combustion	14	9	12
Incineration	8	1	1
Process Losses	8	8	10
Area Source	386	322	366
Total	416	340	389

Allowable Emissions - 416 Tons/year

Particulate Emission Summary - Burlington, Chittenden County

Category	Current Emissions (T/yr)	Optimum Strategy Emissions (T/yr)	1975 Optimum Strategy Emissions (T/yr)
Point Source			
Fuel Combustion	3316	197	176
Incineration	15	3	3
Process Losses	1808	84	100
Area Source	715	547	585
Total	5854	831	864

Allowable Emissions - 4336 Tons/year

Table 4.1 (continued)

Particulate Emission Summary - Brattleboro, Windham County

Category	Current Emissions (T/yr)	Optimum Strategy Emissions (T/yr)	1975 Optimum Strategy Emissions (T/yr)
Point Source			
Fuel Combustion	17	17	22
Incineration			
Process Losses	8	1	1
Area Source	322	234	270
Total	347	252	293

Allowable Emissions - 342 Tons/year

Particulate Emission Summary - Rutland, Rutland County

Category	Current Emissions (T/yr)	Optimum Strategy Emissions (T/yr)	1975 Optimum Strategy Emissions (T/yr)
Point Source			
Fuel Combustion	207	104	132
Incineration			
Process Losses	927	110	140
Area Source	355	344	363
Total	1489	558	635

Allowable Emissions - 671 Tons/year

per cubic meter. This standard was exceeded very significantly at Barre (336), Rutland (346), Burlington (282) and Brattleboro (282) during 1970 and 1971. The effects of the control strategy will be closely monitored to insure compliance with the air quality standards.

4.1.3.2 Sulfur Dioxide

Observations were available only at Barre and Burlington for obtaining an assessment of air quality related to sulfur dioxide. Here the average annual concentration is satisfactory; that is, it is below the secondary standard set in the Environmental Protection Agency regulations as a goal to be achieved. However, the maximum 24-hourly observations exceed those that have been set as standards by the Environmental Protection Agency and by the State of Vermont. The EPA goals for a State such as Vermont is a maximum 24-hourly concentration of less than 260 micrograms per cubic meter. The State standard is 150 micrograms per cubic meter. A value of 312 micrograms per cubic meter was observed in Barre, in February 1971, and a value of 291 micrograms per cubic meter was observed in January 1971. Hence, controls are necessary.

Air quality levels for SO_2 are acceptable in Vermont on an annual basis at the present time but are close to the secondary standards of 60 micrograms per cubic meter. At Burlington annual levels were 51 micrograms per cubic meter, while at Barre a level of 55 micrograms per cubic meter was measured. The anticipated growth in the state will push these areas past the standard in the near future. Maximum 24-hour values at Barre exceed the standard. The permissible emissions in the Barre area are:

$$PE = \frac{260}{312} (1.65) = 1.37 \text{ Tons/day in January}$$

$$\text{or } 236 \text{ Tons/year}$$

where 1.65 is the number of tons per day of SO_2 emitted in January obtained from 285 ton/year/365 days x 2.11 degree day excess in January or February average degree days for the year. The inverse of the expression was used to recover the total emissions in tons per year. With added growth even the existing regulation may be inadequate but the maximum measured value may be created by a local source thus the strategy appears acceptable but the situation will be monitored to determine if the area is meeting the state and federal 24-hour standards.

Table 4.2 shows the emissions to be expected currently, and those that will result from the adoption of the regulations currently in effect for reducing the sulfur content of residual fuel oil and coal by October 1, 1974. The third column shows these regulations in combination with the estimated growth for the Barre and Burlington areas. Again a proportional model calculation is shown as the bottom row of each table. It is anticipated that fuel conversion will satisfy the need for sulfur emissions in the State to provide air quality desired.

4.1.3.3 Assessment of Carbon Monoxide, Hydrocarbons, and Nitrogen Dioxide Pollutants

None of the observed data indicate that these pollutants pose any threat to meeting National Standards except possibly in the Burlington area. There we have only 2 months of observations, but the National Standard calls for a maximum concentration of 10 milligrams per cubic meter of CO over an

8-hour period. The maximum 8-hour observations in June and July of 1971 in Burlington were 9.2 and 10.3 milligrams per cubic meter. Hence, the Burlington area is very close to the current standard. Observations in the Barre area were at a maximum at 7.7 milligrams per cubic meter for carbon monoxide concentration during an 8-hour period. This occurred in April 1971, and apparently does not present a problem at this time. Vermont intends to rely on Federal Motor Vehicle Emission Standards and every indication of the calculations shown in Tables 4,3, 4.4, and 4.5 is that National Standards will be quite sufficient to enable Vermont communities to meet air quality standards required. The current major concentrations were used to calculate the permissible emissions. In this case the maximum concentration over an 8-hour period was used. The Federal Motor Vehicle Emissions Standards were used to establish the optimum strategy column and projection to 1975 was obtained from the growth figures presented in Section 4.2 and taking into account the reduction of emissions expected for automobiles. We do not anticipate a reduction in emissions in the point sources.

Table 4.2

Sulfur Dioxide Emission Summary - Barre, Washington County

Category	Current Emissions (T/yr)	Optimum Strategy Emissions (T/yr)	1975 Optimum Strategy Emissions (T/yr)
Point Source			
Fuel Combustion	57	28	36
Incineration	0	0	0
Process Losses	0	0	0
Area Source	228	200	227
Total	285	228	263

Allowable Emissions - 236 Tons/year based on one 24-hour maximum

Sulfur Dioxide Emission Summary - Burlington, Chittenden County

Category	Current Emissions (T/yr)	Optimum Strategy Emissions (T/yr)	1975 Optimum Strategy Emissions (T/yr)
Point Source			
Fuel Combustion	4,186	2,306	2,570
Incineration	2	2	2
Process Losses	29	29	34
Area Source	810	705	815
Total	5,027	3,042	3,420

Allowable Emissions - 3,427 Tons/year

Table 4.3

Nitrogen Dioxide Emission Summary - Burlington, Chittenden County

Category	Current Emissions (T/yr)	Optimum Strategy Emissions (T/yr)	1975 Optimum Strategy Emissions (T/yr)
Point Source			
Fuel Combustion	821	372	438
Incineration	-	-	-
Process Losses	-	-	-
Area Source	3,209	2,455	2,909
Total	4,030	2,827	3,347

Nitrogen Dioxide Emission Summary - Barre, Washington County

Category	Current Emissions (T/yr)	Optimum Strategy Emissions (T/yr)	1975 Optimum Strategy Emissions (T/yr)
Point Source			
Fuel Combustion	17	13	17
Incineration	-	-	-
Process Losses	-	-	-
Area Source	763	618	709
Total	780	631	726

Table 4.4

Hydrocarbon Emission Summary - Burlington, Chittenden County

Category	Current Emissions (T/yr)	Optimum Strategy Emissions (T/yr)	1975 Optimum Strategy Emissions (T/yr)
Point Source			
Fuel Combustion	68	68	80
Incineration	-	-	-
Process Losses	-	-	-
Area Source	7,655	4,717	5,297
Total	7,723	4,785	5,377

Hydrocarbon Emission Summary - Barre, Washington County

Category	Current Emissions (T/yr)	Optimum Strategy Emissions (T/yr)	1975 Optimum Strategy Emissions (T/yr)
Point Source			
Fuel Combustion	2	2	3
Incineration	-	-	-
Process Losses	-	-	-
Area Source	1,323	1,088	1,257
Total	1,325	1,090	1,260

Table 4.5

Carbon Monoxide Emission Summary - Burlington, Chittenden County

Category	Current Emissions (T/yr)	Optimum Strategy Emissions (T/yr)	1975 Optimum Strategy Emissions (T/yr)
Point Source			
Fuel Combustion	151	151	153
Incineration	-	-	-
Process Losses	-	-	-
Areas Source	29,266	16,400	20,572
Total	29,417	16,551	20,725

Carbon Monoxide Emission Summary - Barre, Washington County

Category	Current Emissions (T/yr)	Optimum Strategy Emissions (T/yr)	1975 Optimum Strategy Emissions (T/yr)
Point Source			
Fuel Combustion	52	52	52
Incineration	-	-	-
Process Losses	-	-	-
Area Source	6,877	3,964	4,922
Total	6,929	4,016	4,974

4.1.4 Conclusions

The topography and land use in Vermont are such that one has to consider small sections of the State when assessing air quality emissions and the effect of regulations on emissions on future air quality. Villages are isolated from each other; they tend to be in valleys, separated by ridges. Hence, they generate their own local pollution and receive little from outside sources. On the basis of the proportional modeling technique, the emissions inventory, and the air quality data, it is evident that the existing regulations of the State Department of Health of Vermont dealing with air pollution are appropriate to yield satisfactory air quality in the State in the year 1975. The regulations are included as Appendix A to this report.

Vermont regulations were established only after consideration of available technology to limit emissions. Due consideration was given to economic impact balanced against the benefit of clean air for everyone. The regulations that were finally promulgated are within the state of the art of good industrial practice. Air cleaning equipment or process modifications are available to comply with the regulations now.

4.2 Description of Plan

4.2.1 Air Quality Data

Air quality data for particulates, sulfur dioxide, carbon monoxide, hydrocarbons, nitrogen dioxide and ozone are shown in Table 4.6. This table is in the form prescribed by Appendix H of Title 42 Public Health Chapter 4, Environmental Protection Agency Rules and Regulations Part 420, Requirements for Preparation, Adoption and Submittal of Implementation Plans. It indicates the pollutant, the sampling site location in Universal Transverse Mercator grid coordinates, the sampling interval, the starting and ending date of the sample period, the number of 24-hour samples and concentration data. Maximum 1-hour values are shown for ozone and carbon monoxide. Maximum 8-hour values are shown for carbon monoxide, while maximum 24-hour values are shown for all data. In addition, the annual arithmetic mean and standard deviation, the annual geometric mean and standard deviation are indicated. These data show that Vermont counties should be classified as Priority II or III regions.

There seem to be no local peculiarities except possibly at Rutland in the case of particulates, where the sampler may have been biased by being located in a dead air space on the roof of a building near local road construction. Examination of the particulate matter indicated high levels of dust corresponding to the construction.

The areas shown in Figures 4.1, 4.2, 4.3, 4.4 and 4.5 indicate those areas where emissions were obtained on a more comprehensive basis in 25 square kilometers grid intervals. The observing site in each case was well within the boundaries of these heavy emissions areas. Hence, they should be representative of near maximum concentrations of pollutant in all cases.

VERMONT IMPLEMENTATION PLAN
Table 4.6 (Additions)

Pollutant	UTM Coordinates		Saroad Site Identification	Agency Code	Method Code
	E	N			
Particulates					
Barre	697.5	4893.3	47-0040-001	F	91
Burlington	641.9	4924.4	47-0140-003	F	91
Burlington	640.4	4927.0	47-0140-004	F	91
Brattleboro	698.7	4725.0	47-0120-001	F	91
Rutland	663.1	4829.8	47-0400-001	F	91
Shoreham	630.7	4855.7	47-0020-001	F	91
Randolph	692.3	4866.2	47-0360-001	F & A	91
Sulf. Diox.					
Barre	697.5	4893.3	47-0040-001	F	11
Burlington	641.9	4924.4	47-0140-003	F	11
Carbon Monox.					
Barre	697.5	4893.3	47-0040-001	F	11
Burlington	641.9	4924.4	47-0140-003	F	11
Hydrocarbons					
Barre	697.5	4893.3	47-0040-001	F	11
Burlington	641.9	4924.4	47-0140-003	F	11
Nitrogen Diox.					
Barre	697.5	4793.3	47-0040-001	F	11
Burlington	641.9	4924.4	47-0140-003	F	11
Ozone					
Barre	697.5	4893.3	47-0040-001	F	14
Burlington	641.9	4924.4	47-0140-003	F	14
Underhill	670.8	4931.2	47-0180-001	F	14

Table 4.6

Air Quality Data Summary for Vermont

Concentration in micrograms per cubic meter

Pollutant	Location		Sampling Int. (months)	Start Date	End Date
	X	Y			
Particulates					
Barre	697.5	4893.3	11	4 Aug.70	25 June 71
Burlington	641.9	4924.4	12	11 Jul.70	30 June 71
Burlington	640.4	4927.0	11	22 Aug.70	28 June 71
Brattleboro	698.7	4745.0	8	27 Nov.70	30 June 71
Rutland	663.1	4829.8	11	17 Aug.70	30 June 71
Shoreham	630.7	4855.7	12	7 Jul.70	28 June 71
Randolph	692.3	4866.2	12	4 Jul.70	21 June 71
Sulfur Dioxide					
Barre	697.5	4893.3	18	28 Jan.70	3 June 71
Burlington	641.9	4924.4	12	11 Jul.70	30 June 71
Carbon Monoxide					
Barre	697.5	4893.3	4	Mar.71	June 71
Burlington	641.9	4924.4	2	June 71	Jul. 71
Nitrogen Dioxide					
Barre	697.5	4793.3	6	Jul. 70	June 71
Burlington	641.9	4924.4	12	Aug. 70	Jul. 71
Ozone (Uncorrected for NO_2 or SO_2)					
Barre	697.5	4893.3	4	Mar.71	Jul.71
Burlington	641.9	4924.4	10	Oct.70	Aug.71
Underhill	670.8	4931.2	2	June 71	Jul.71

Table 4.6 (continued)

	No.of Samples	Maximum 1 hr.	Maximum 8 hrs.	Maximum 24 hrs.	Annual Arith Mean	Std. Dev.	Annual Geometric Mean	Geo. Std. Dev.
Particulates								
Barre	216	-	-	336	62.0	38.	54.5	1.64
Burlington	183	-	-	285	81.4	44.5	70.5	1.74
Burlington	178	-	-	144	50.3	27.6	43.3	1.75
Brattleboro	160	-	-	282	71.2	44.5	60.4	1.77
Rutland	208	-	-	346	114.2	68.4	96.5	1.79
Shoreham	45	-	-	144	47.4	30.9	38.7	1.92
Randolph	26	-	-	73	35.5	16.4	32.1	1.58
Sulfur Diox.								
Barre	298	944.2	-	312	55.4	47.0	41.1	2.28
Burlington	244	752.8	-	220	50.8	37.6	40.5	1.93
Carbon Monox.*								
Barre	74	9.2	7.7	7.0	3.2	1.2	3.0	1.93
Burlington	38	14.9	10.3	8.7	5.3	1.5	5.1	1.38
Nitrogen Diox.								
Barre	82	130.1	-	82.9	17.2	14.3	12.7	2.25
Burlington	297	113.1	-	85.3	25.0	23.9	19.9	1.90
Ozone								
Barre	80	137.8	-	80.6	35.5	13.9	33.1	1.47
Burlington	160	196.8	-	129.8	22.4	18.7	17.1	2.17
Underhill	34	88.6	-	62.9	20.6	13.4	16.4	2.14

* Reported in milligrams per cubic meter.

Table 4.6(a)

National Ambient Air Quality Standards

Pollutant	Max. 1 hr.	Max. 3 hr.	Max. 2 hr.	Max. 24 hr.	Annual Arith. Mean	Annual Geometric Mean
Particulate*	--	--	--	150	--	60
Sulfur Dioxide*	--	1300	--	.1 260	60 .02	--
Carbon Monoxide**	40	--	10	--	--	--
Hydrocarbon (non methane)	--	160	--	--	--	--
Nitrogen Oxides	--	--	--	--	100	--
Oxidant	160	--	--	--	--	--

*Secondary standards are stated. "In any region where measured or estimated ambient levels of a pollutant area are below the levels specified an applicable secondary standard, the plan shall set forth a control strategy which shall be adequate to prevent such ambient pollutants levels from exceeding such secondary standards. (420.12,b)."

**Reported in milligrams per cubic meter.

Most samplers are located in the grid squares where maximum emissions are currently observed. The exception was in Rutland where the maximum emissions are centered about a mile to the northwest; see Figure 4.1c and Figure 4.2c. Considering the wind rose, Figure 4.0, the sampling locations are all quite acceptable at present in Burlington. Control strategies will be reevaluated from time to time and consideration will be given to relocating the air quality monitoring equipment in a site more representative of maximum pollutant concentration. The meteorology of the area is such that winds are from the north to northwest or from the south, paralleling the ridge and valleys. Wind patterns are also considered when locating sampling equipment.

The background data were obtained at the town of Randolph in the central part of Vermont, a rural location. However, there was a dirt road near the sampling site which may occasionally have affected some of the samples. The recorded geometric mean for Randolph was 32.1 micrograms per cubic meter which was rounded down to 30 micrograms per cubic meter for modeling purposes to eliminate the effect of the dirt road.

Figures 4.1 to 4.5 show detailed inventories and the location of the sampling stations for Chittenden, Rutland, Washington and Windham Counties. Maps such as these will be used to locate future sampling positions described in Section 7 and shown on Figure 7.1 in areas of maximum concentration.

WIND FREQUENCIES;

BURLINGTON

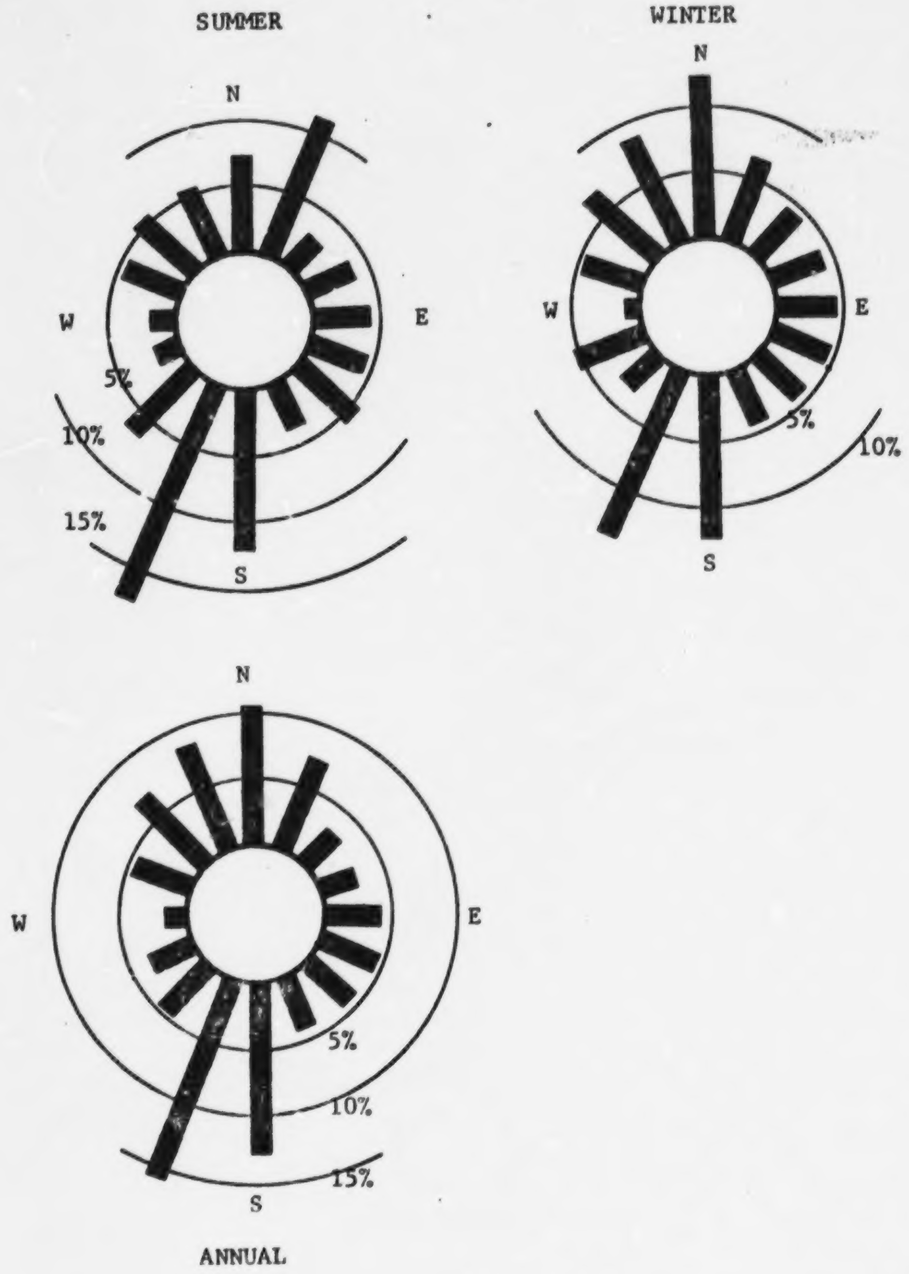
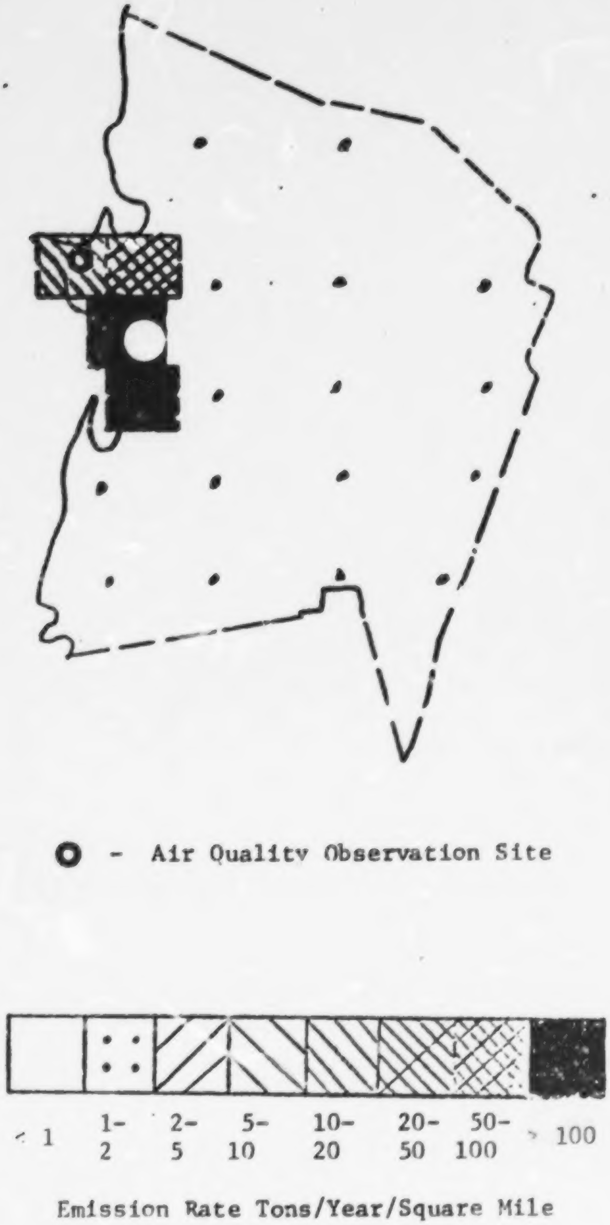


Figure 4.0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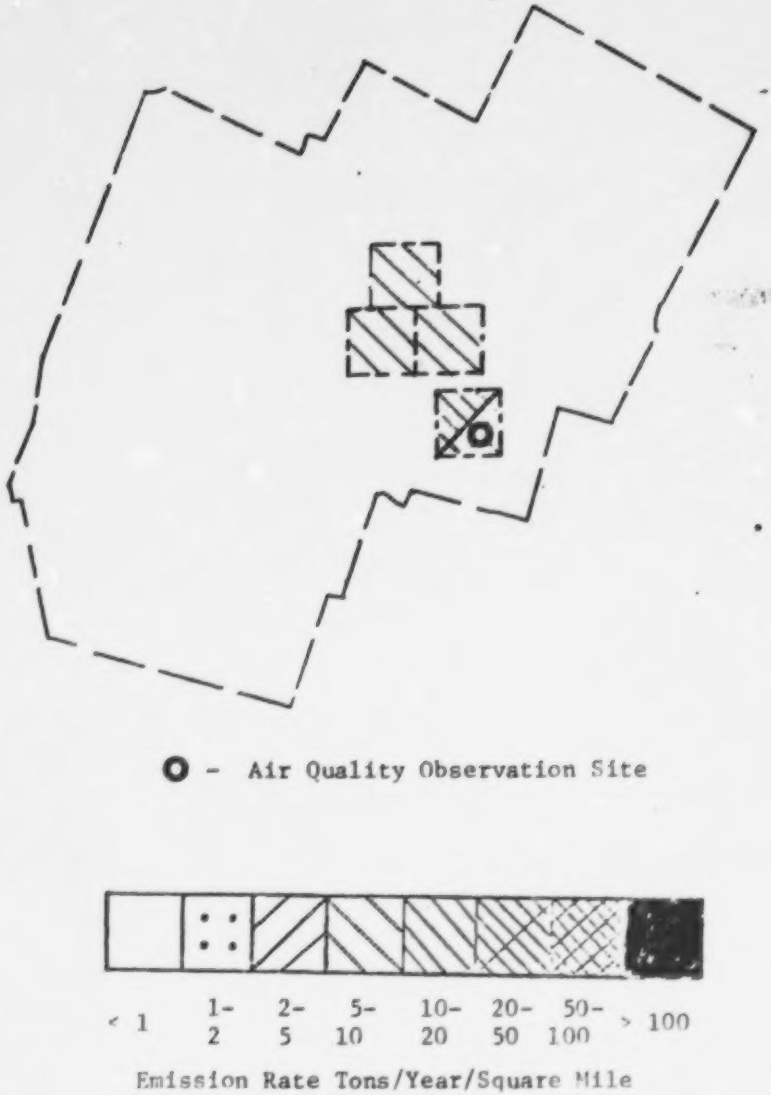
10- 20
20- 50
50- 100
> 100
Emission Rate Tons/Year/Square Mile

Figure 4.1a Particulate Emissions Chittenden County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100
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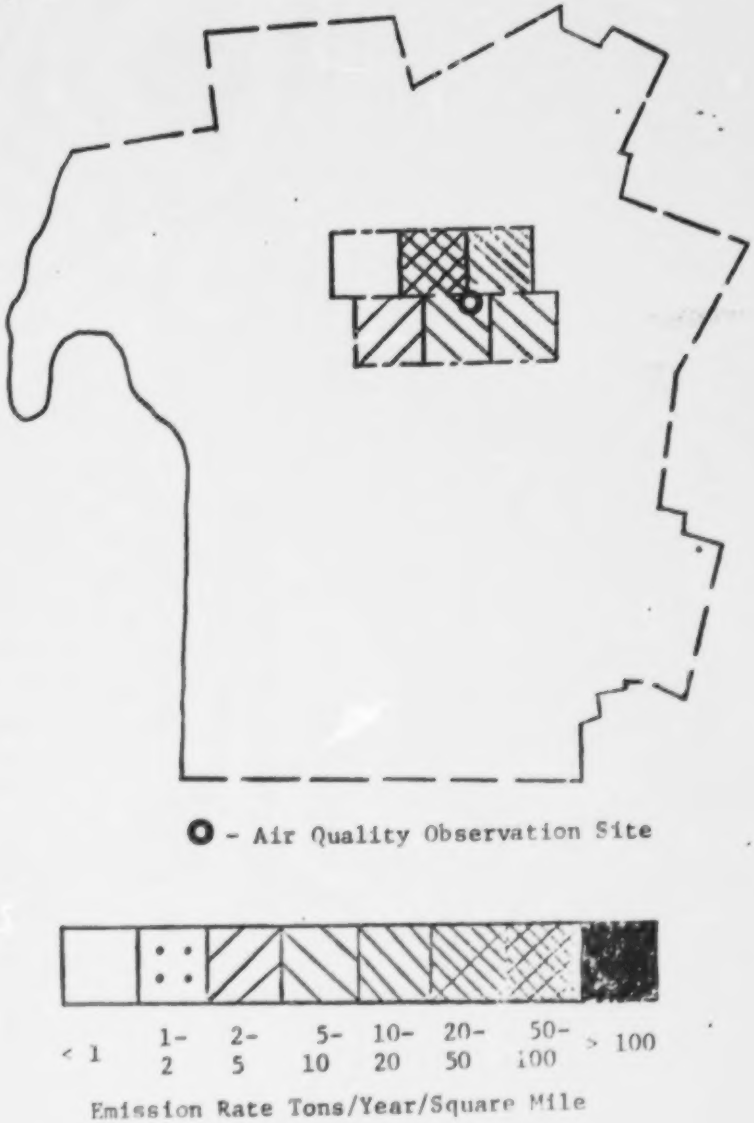
Emission Rate Tons/Year/Square Mile

Figure 4.1b Particulate Emissions
Washington County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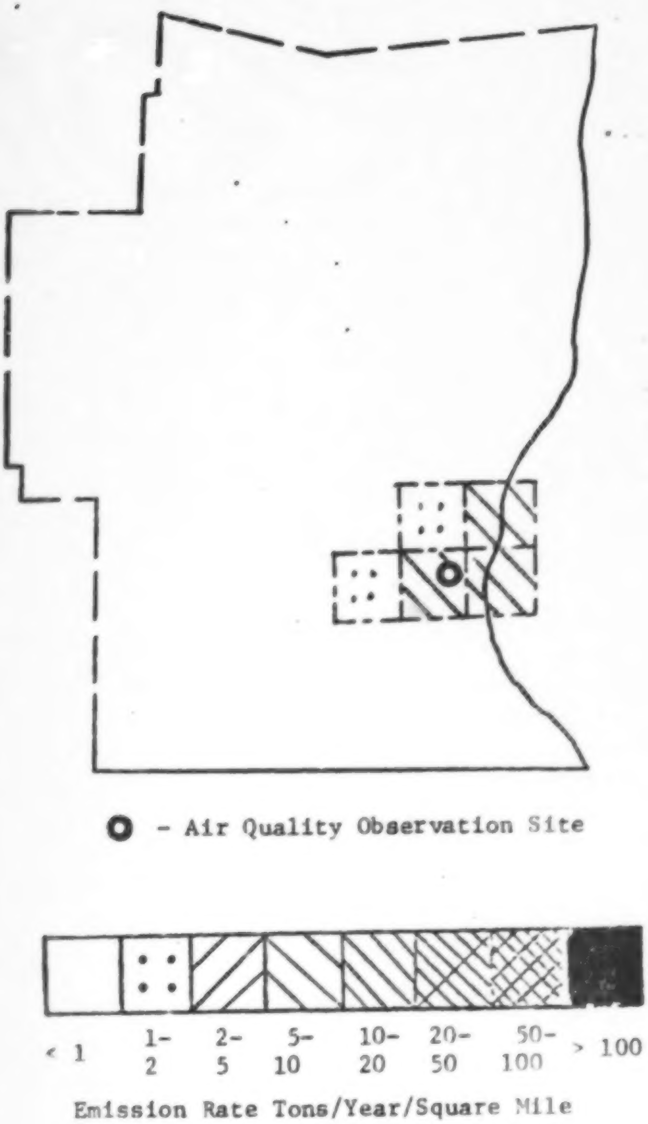
20-50
50-100
> 100
Emission Rate Tons/Year/Square Mile

Figure 4.1c Particulate Emissions
Rutland County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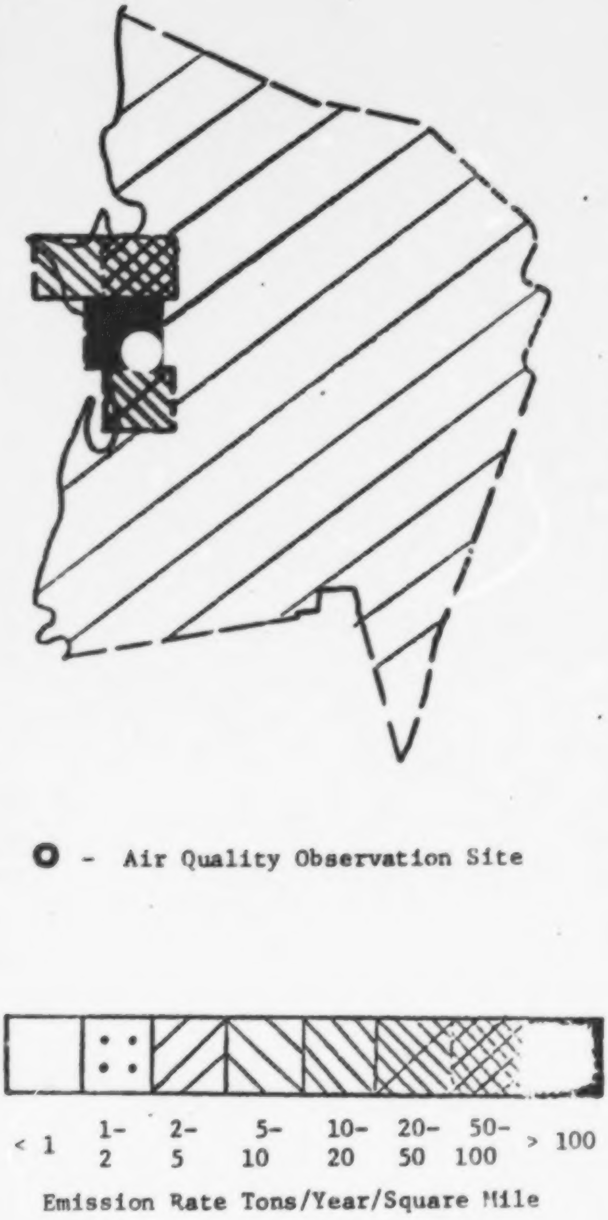
> 100
Emission Rate Tons/Year/Square Mile

Figure 4.1d Particulate Emissions Windham County


O - Air Quality Observation Site
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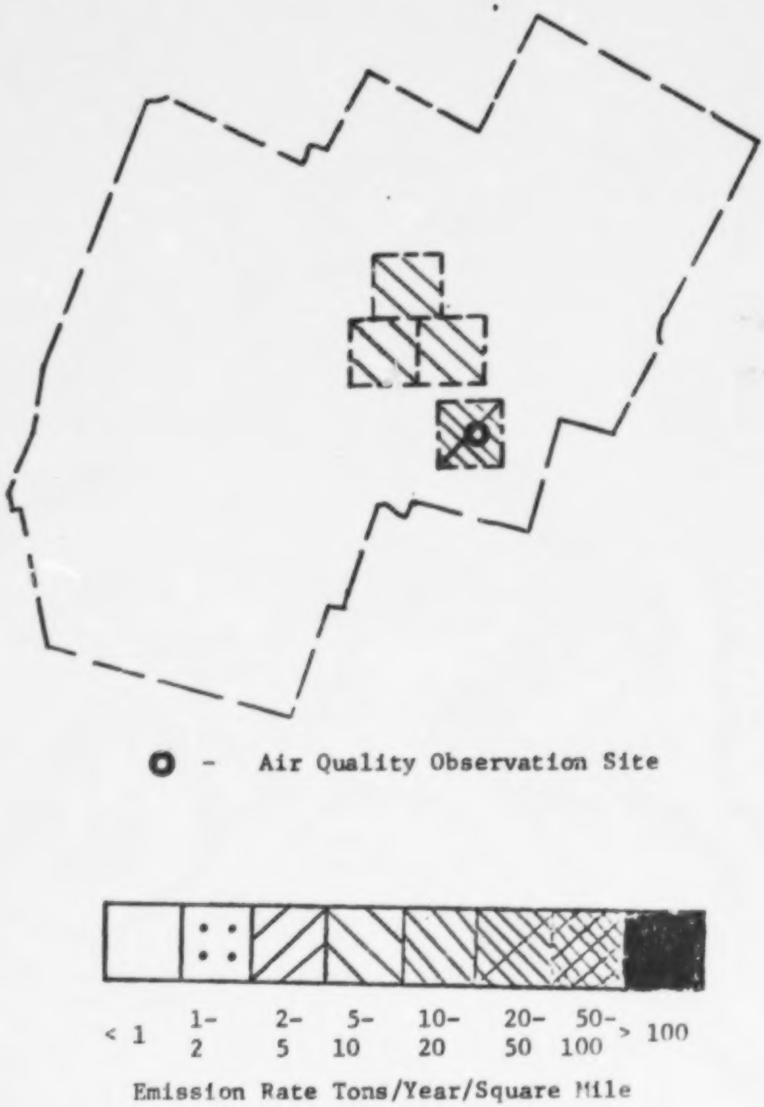
20-50
50-100
> 100
Emission Rate Tons/Year/Square Mile

Figure 4.2a Sulfur Dioxide Emissions
Chittenden County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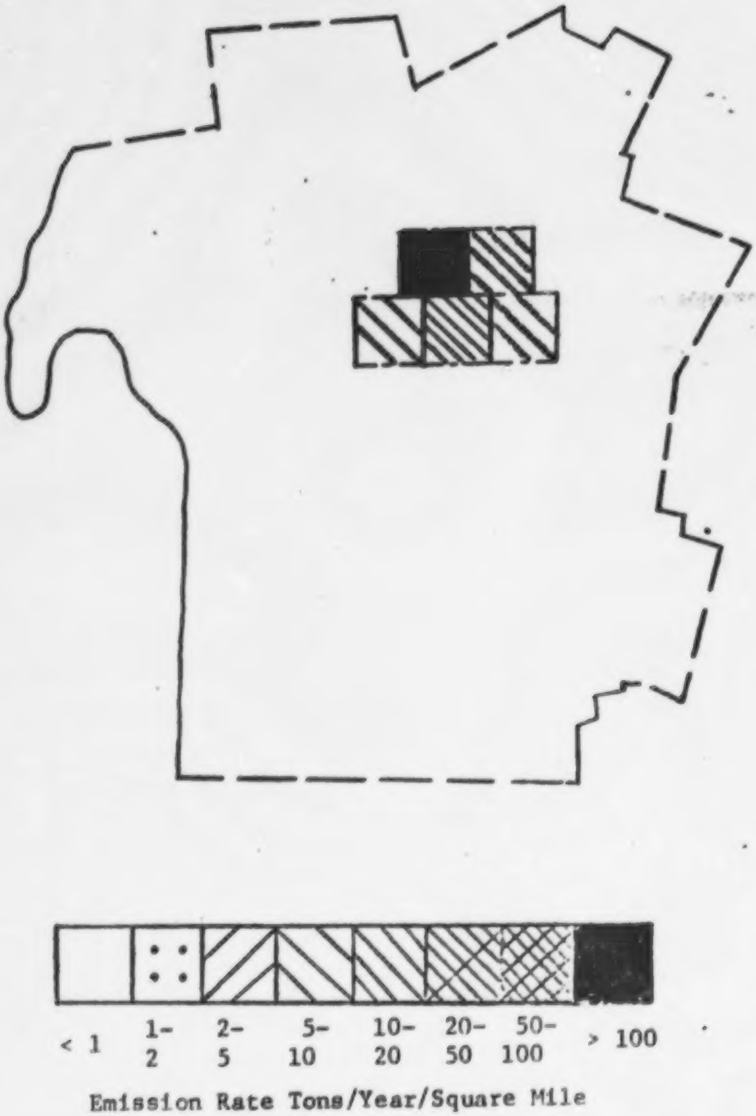
Emission Rate Tons/Year/Square Mile

Figure 4.2b Sulfur Dioxide Emissions
Washington County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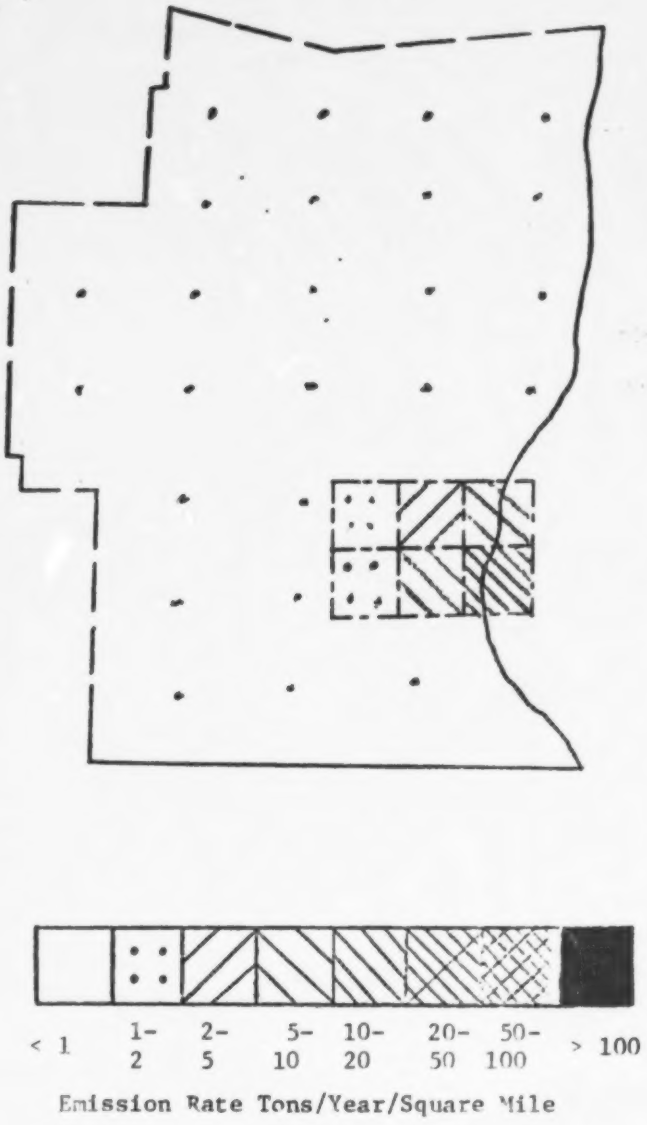
Emission Rate Tons/Year/Square Mile

Figure 4.2c Sulfur Dioxide Emissions
Rutland County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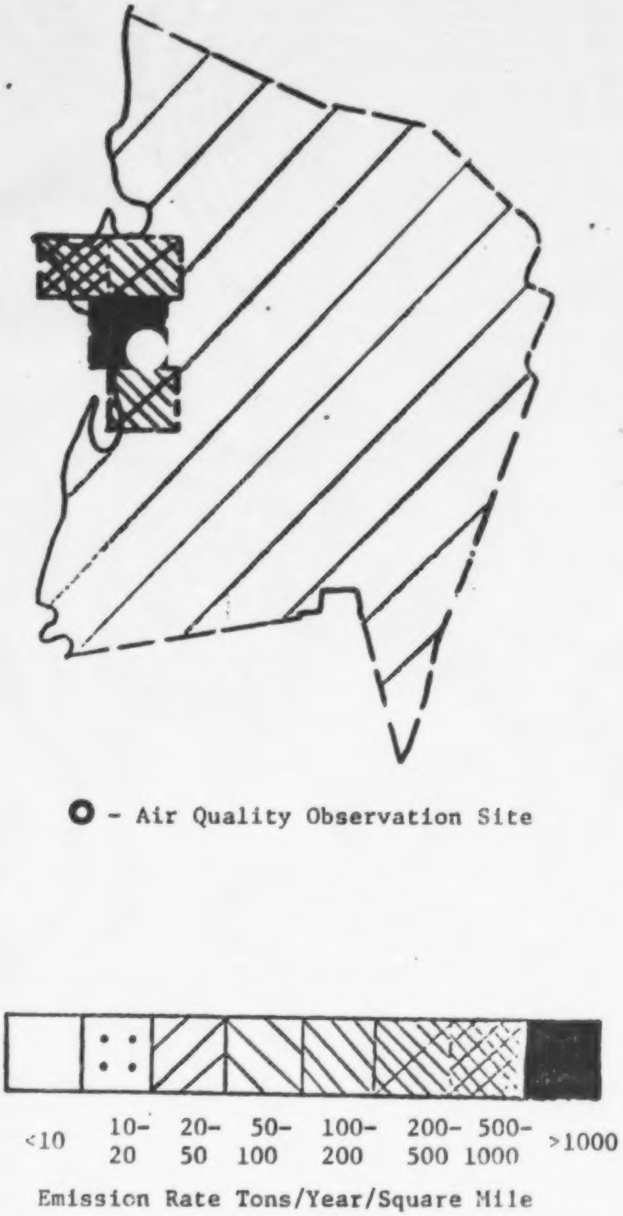
Emission Rate Tons/Year/Square Mile

Figure 4.2d Sulfur Dioxide Emissions
Windham County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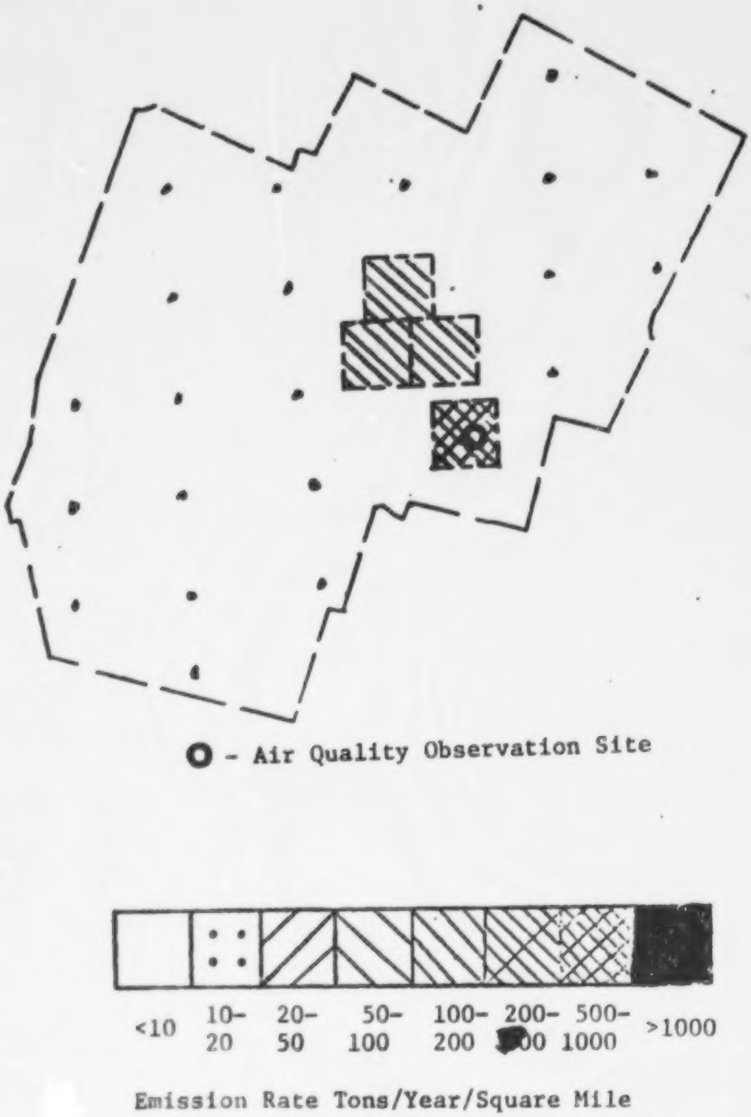
100-200
200-500
500-1000
>1000
Emission Rate Tons/Year/Square Mile

Figure 4.3a Carbon Monoxide Emissions
Chittenden County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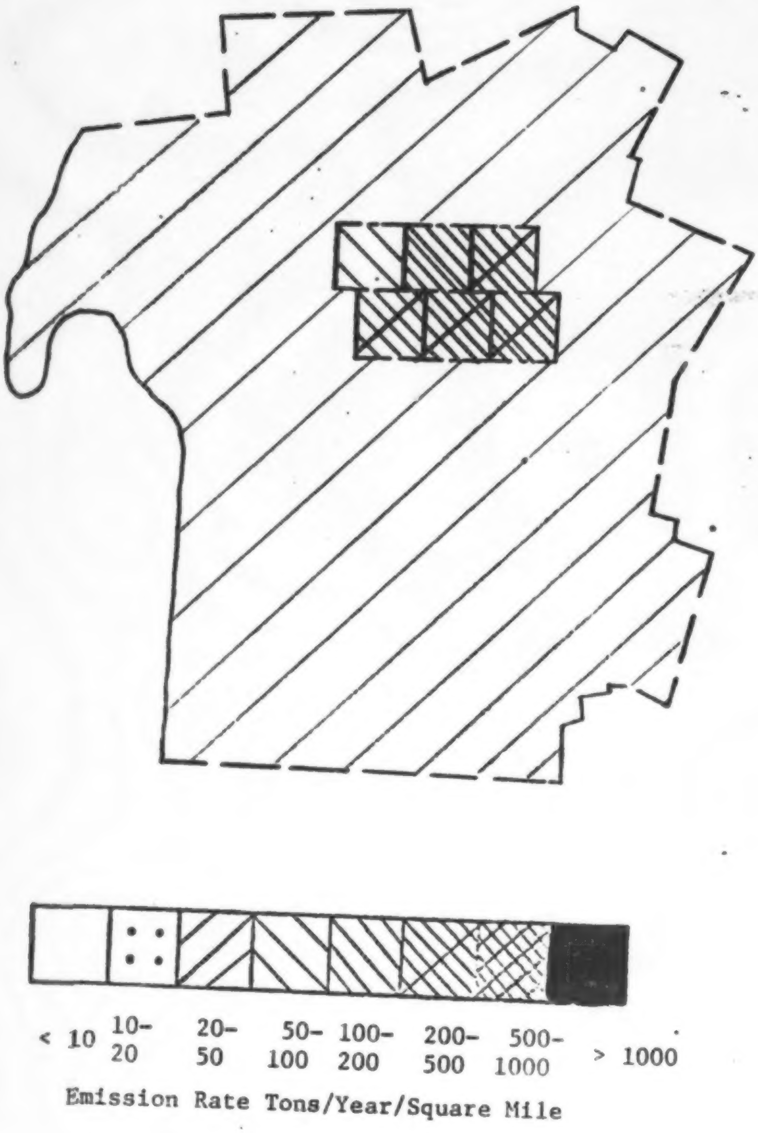
50-
100
100-
200
200-
[illegible]00
500-
1000
>1000
Emission Rate Tons/Year/Square Mile

Figure 4.3b Carbon Monoxide Emissions
Washington County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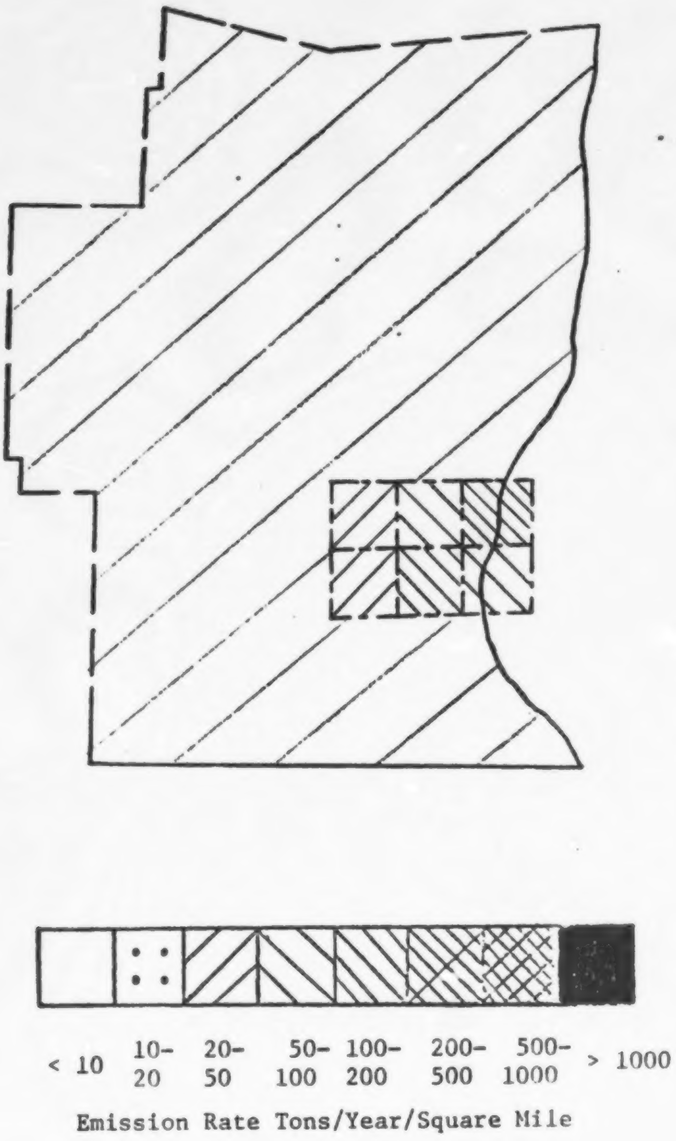
200
200-
500
500-
1000
> 1000
Emission Rate Tons/Year/Square Mile

Figure 4.3c Carbon Monoxide Emissions
Rutland County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200-500
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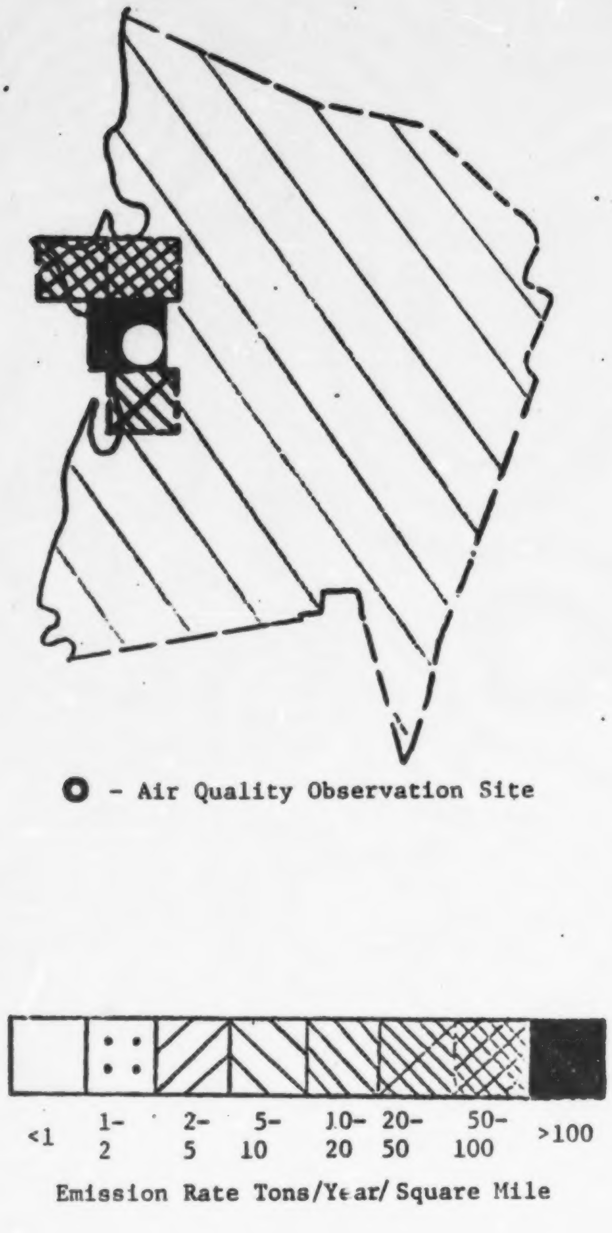
> 1000
Emission Rate Tons/Year/Square Mile

Figure 4.3d Carbon Monoxide Emissions
Windham County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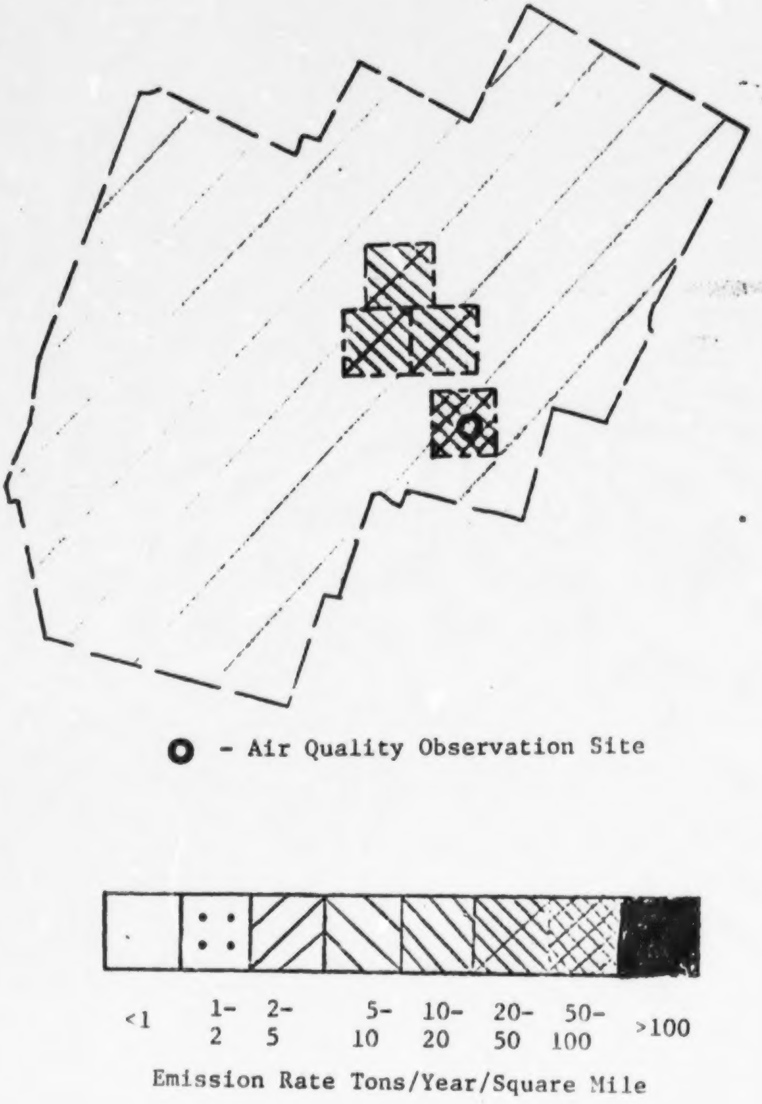
Emission Rate Tons/Year/ Square Mile

Figure 4.4a Nitrogen Dioxide Emissions
Chittenden County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20-50
50-100
>100
Emission Rate Tons/Year/Square Mile

Figure 4.4b Nitrogen Dioxide Emissions
Washington County

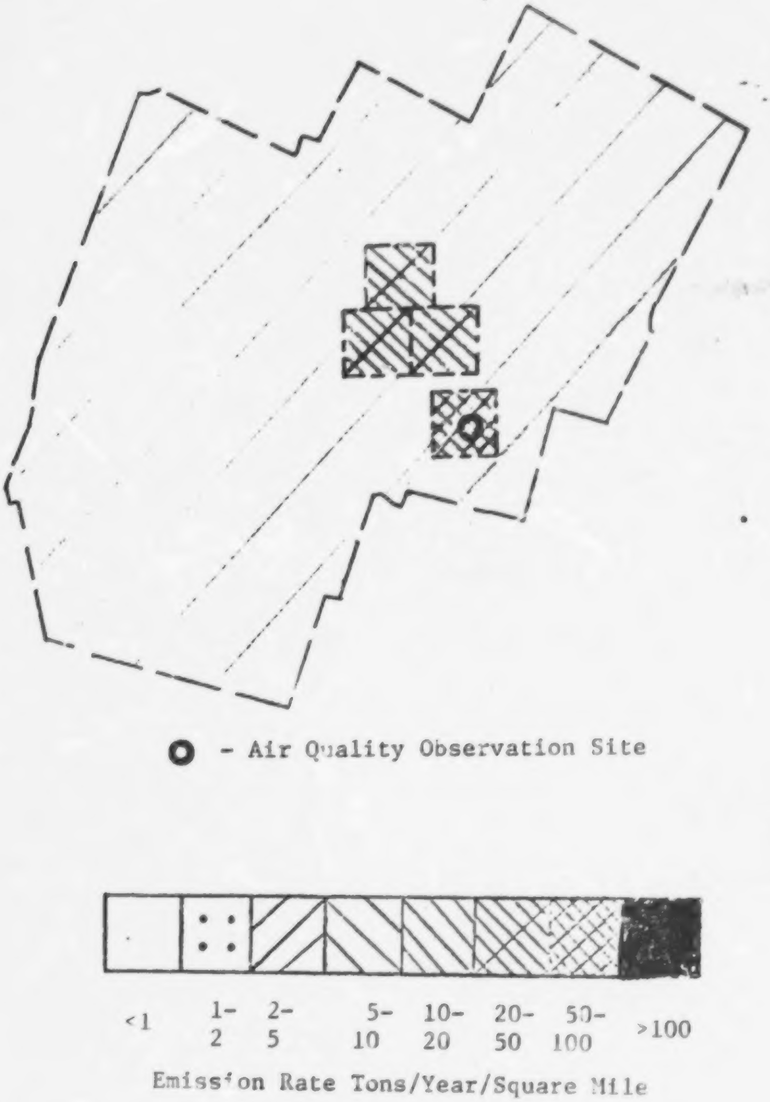

O - Air Quality Observation Site
<1
1-2
2-5
5-10
10-20
20-50
50-100
>100
Emission Rate Tons/Year/Square Mile

Figure 4.4b Nitrogen Dioxide Emissions
Washington County

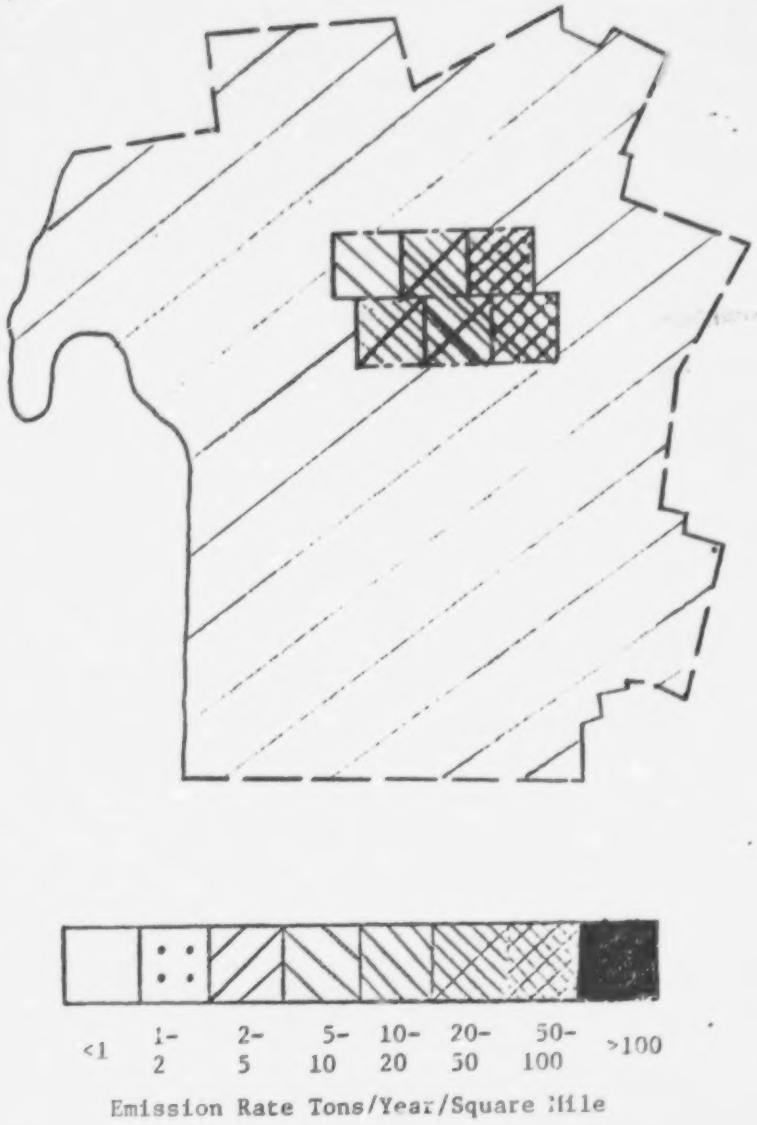

<1
1-2
2-5
5-10
10-20
20-50
50-100
>100
Emission Rate Tons/Year/Square Mile

Figure 4.4c Nitrogen Dioxide Emissions
Rutland County

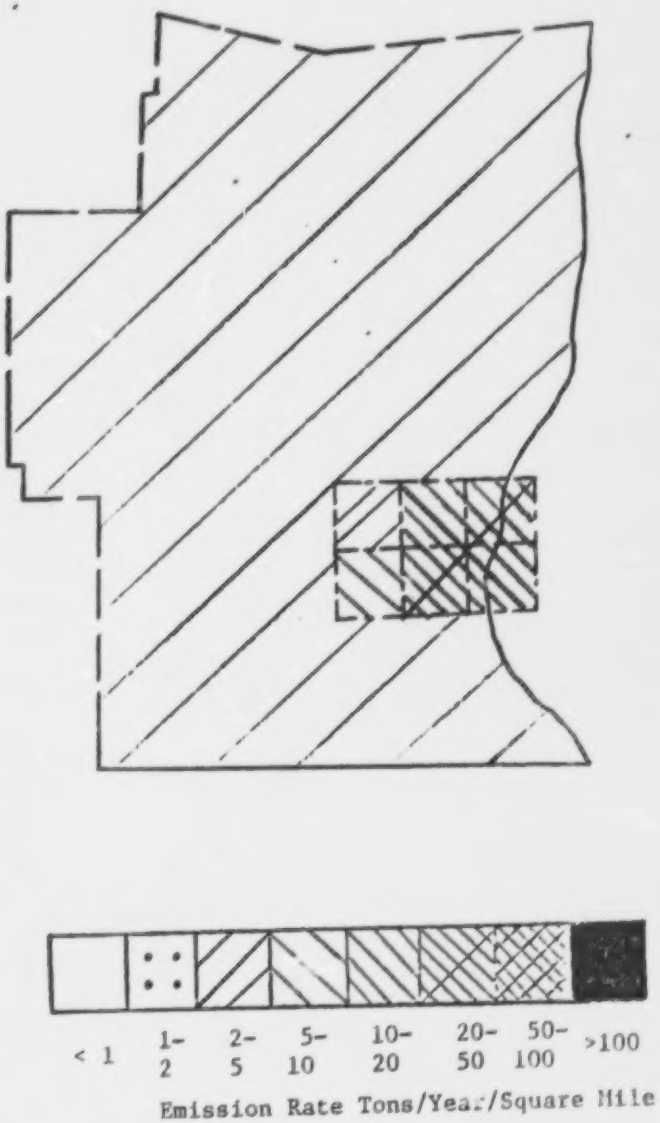

< 1
1-2
2-5
5-10
10-20
20-50
50-100
>100
Emission Rate Tons/Year/Square Mile

Figure 4.4d Nitrogen Dioxide Emissions
Windham County

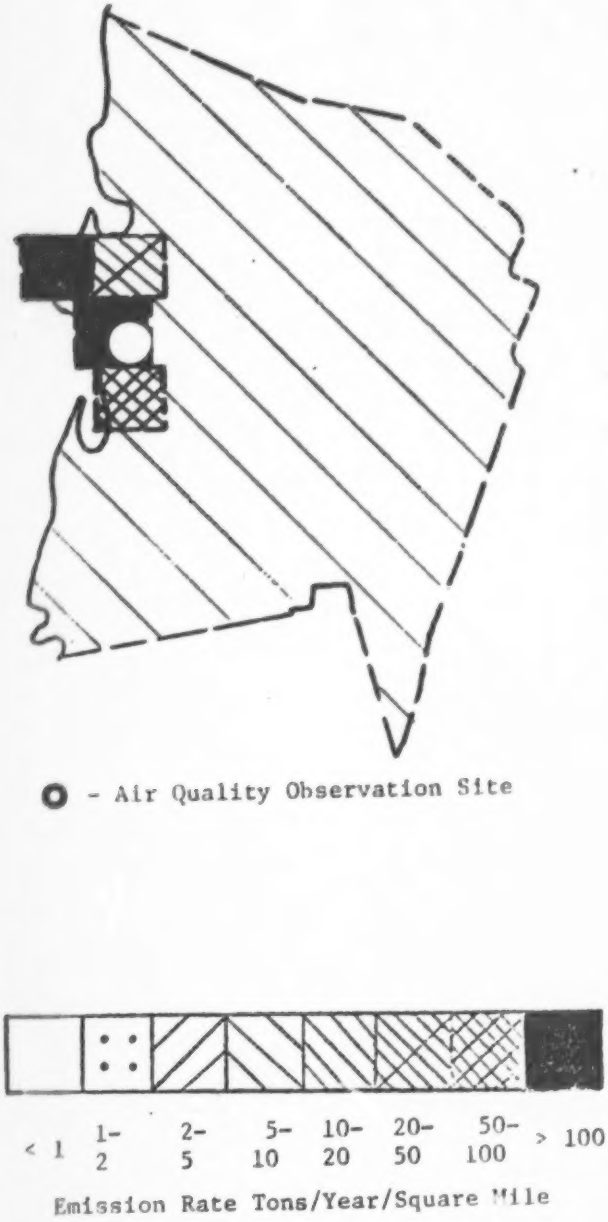

- Air Quality Observation Site
< 1
1-2
2-5
5-10
10-20
20-50
50-100
> 100
Emission Rate Tons/Year/Square Mile

Figure 4.5a Hydrocarbon Emissions
Chittenden County

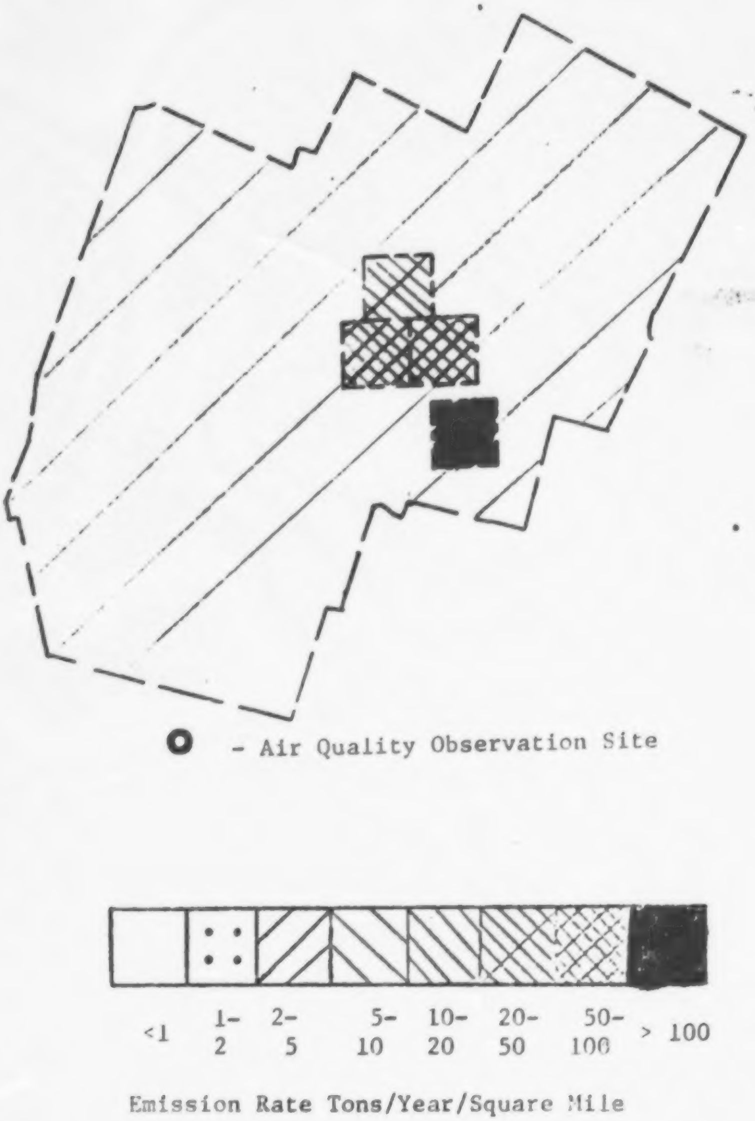

○ - Air Quality Observation Site
<1
1-2
2-5
5-10
10-20
20-50
50-100
> 100
Emission Rate Tons/Year/Square Mile

Figure 4.5b Hydrocarbon Emissions
Washington County

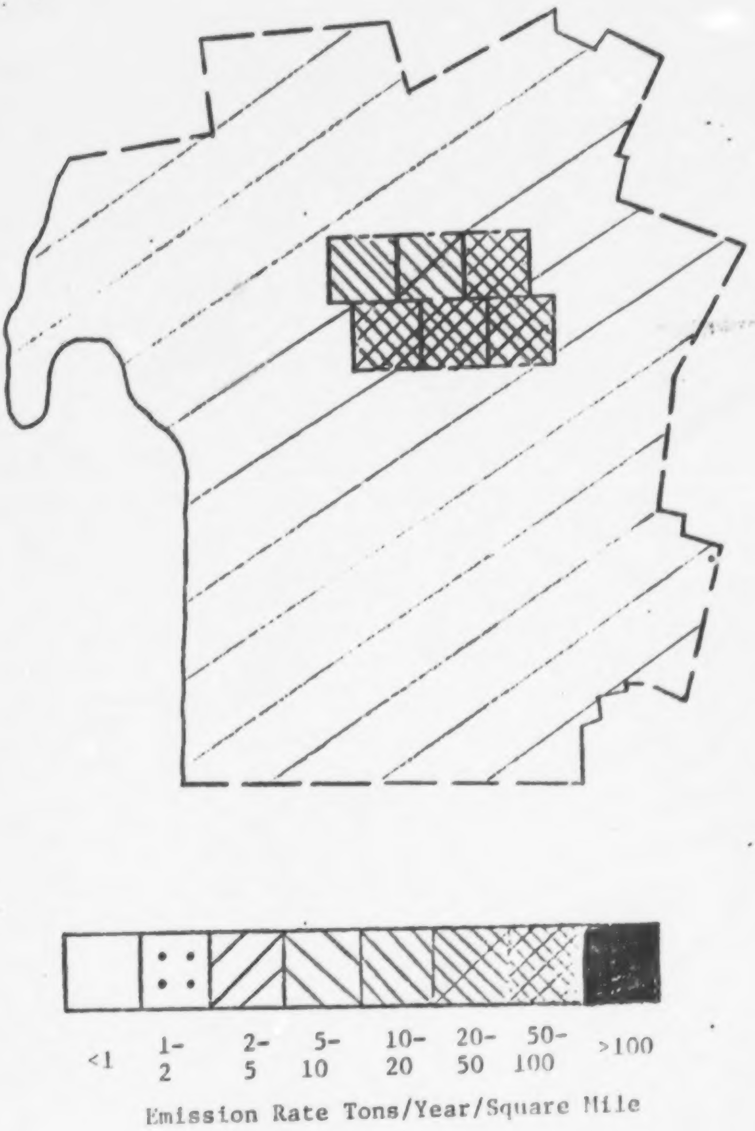

<1
1-
2
2-
5
5-
10
10-
20
20-
50
50-
100
>100
Emission Rate Tons/Year/Square Mile

Figure 4.5c Hydrocarbon Emissions
Rutland County

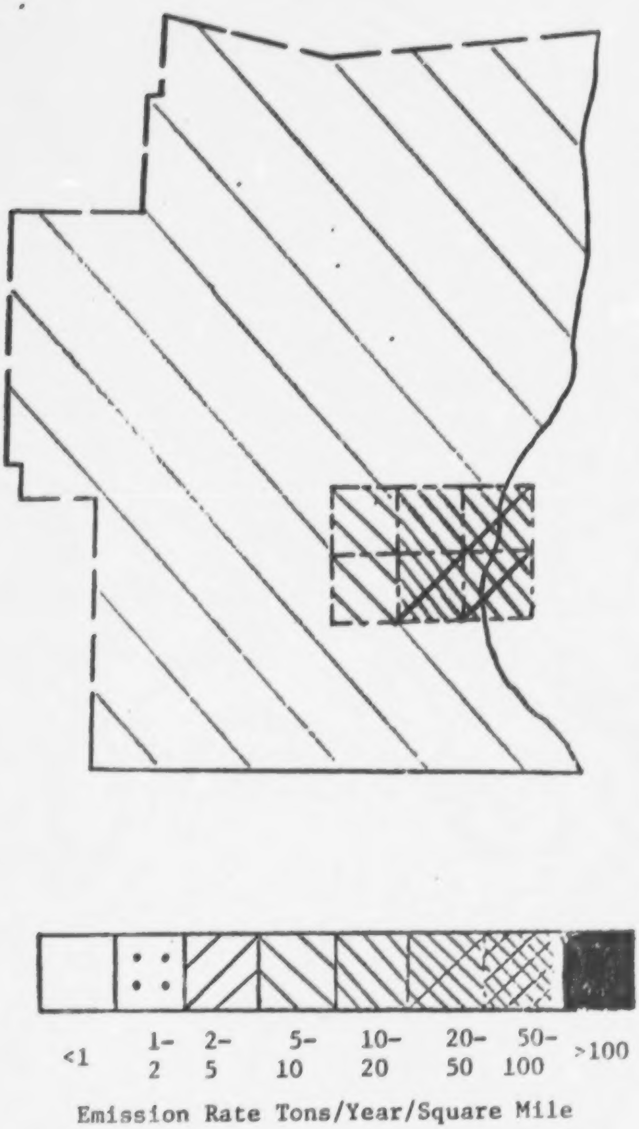

<1
1-
2
2-
5
5-
10
10-
20
20-
50
50-
100
>100
Emission Rate Tons/Year/Square Mile

Figure 4.5d Hydrocarbon Emissions
Windham County

4.2.2 Current Emissions of Particulates and Sulfur Dioxide

Emissions of particulates and sulfur dioxide in the two sections of Vermont designated as Air Quality Control Regions are listed by county in the following tables in the format specified by EPA regulations and illustrated in Figures 4.6 and 4.7. Particulate emissions from wood are shown in only two categories, residential fuel combustion and wood processing as industrial process point sources. It is difficult to determine the amount of wood used for process steam and space heating in commercial and industrial sources; therefore, all wood emissions were placed in the process category. Natural gas emission entries in the tables reflect both natural gas piped to the Burlington area from Canada and bottled liquid natural gas used in other areas of the State.

7.

TABLE 4.7
VERMONT
PARTICULATE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 159
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

urce Category	Counties					
	Chittenden	Addison	Franklin	Grand Isle	Rutland	Region Total
I. Fuel Combustion - stationary sources						
A. Residential Fuel:						
1. Bituminous Coal:						
a. Area Sources	8	3	5	0	8	24
b. Point Sources						
2. Distillate Oil:						
a. Area Sources	236	47	62	9	117	471
b. Point Sources						
3. Residual Oil						
a. Area Sources						
b. Point Sources						
4. Natural Gas:						
a. Area Sources	3	2	0	0	0	5
b. Point Sources						
5. Wood:						
a. Area Sources	103	156	225	36	149	669
b. Point Sources						
6. Total	350	208	292	45	274	1169
B. Commercial and Institutional Fuel:						
1. Bituminous Coal:						
a. Area Sources	2	1	1	0	2	6
b. Point Sources	30	2	0	0	0	32
2. Distillate Oil:						
a. Area Sources	55	17	25	4	47	148
b. Point Sources	7	1	0	0	0	8
3. Residual Oil:						
a. Area Sources	3	1	2	0	2	8
b. Point Sources	0	10	3	0	8	21
4. Natural Gas:						
a. Area Sources	3	0	0	0	0	3
b. Point Sources	0	0	8	0	0	8
5. Total	100	32	39	4	59	234

TABLE 4.7 (continued)
VERMONT
PARTICULATE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 159
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

	Counties					
Source Category	Chittenden	Addison	Franklin	Grand Isle	Rutland	Region Total
C. Industrial Fuel:						
1. Bituminous Coal:						
a. Area Sources	3	1	2	0	4	10
b. Point Sources	6	1	0	0	0	7
2. Distillate Oil:						
a. Area Sources	7	1	1	0	1	10
b. Point Sources	6	1	0	0	1	8
3. Residual Oil:						
a. Area Sources	10	4	4	0	12	30
b. Point Sources	48	2	19	1	59	129
4. Natural Gas:						
a. Area Sources						
b. Point Sources	3					3
5. Total	83	10	26	1	77	197
. Steam-electric Power Plant Fuel (point sources only):						
1. Anthracite Coal						
2. Bituminous Coal	3273	0	0	0	0	3273
3. Coke						
4. Distillate Oil	21	7	4	0	68	100
5. Residual Oil	7	0	0	0	0	7
6. Natural Gas						
7. Total	3301	7	4	0	68	3380
. Total Stationary Fuel Combustion	3834	257	361	50	478	4980
II. Process Losses:						
A. Area Sources						
B. Point Sources						
1. Chemical Process Industries		45	675			720
2. Food & Agricultural Industries						
3. Metallurgical Industries						
4. Mineral Products Industries	1560	33	1081		252	2926
5. Petroleum Refining & Petrochemical Operations	243	72			675	990
6. Wood Processing	15	33	0		71	119
7. Petroleum Storage						
. Total Process Losses	1818	183	1756	0	998	4755

TABLE 4.7 (continued)
VERMONT
PARTICULATE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 159
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties					
	Chittenden	Addison	Franklin	Grand Isle	Rutland	Region Total
I. olid Waste Disposal:						
Incineration:						
1. On-site:						
a. Area Sources	10	2	3	0	5	20
b. Point Sources						
2. Municipal, etc.:						
a. Area Sources						
b. Point Sources						
Open Burning:						
1. On-site:						
a. Area Sources	714	175	226	26	381	1522
b. Point Sources						
Total Solid Waste Disposal	724	177	229	26	386	1542
ransportation (area sources only):						
Motor Vehicles						
1. Gasoline Powered	146	65	57	18	138	424
2. Diesel Powered	11	1	1	0	15	28
B. Off-highway Fuel Usage						
Aircraft	294					294
D. Railroads	9	2	4	0	4	19
Vessels	4					4
Gasoline Handling Evaporative Losses						
Other (specify)						
Total Transportation	464	68	62	18	157	769
Grand Totals						
Area Sources	1621	478	618	93	885	3695
B. Point Sources	5219	207	1790	1	1134	8351
Total	6840	685	2408	94	2019	12046

TABLE 4.8
VERMONT
PARTICULATE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties					
	Bennington	Caledonia	Essex	Lamoille	Orange	
I. Fuel Combustion - Stationary sources						
A. Residential Fuel:						
1. Bituminous Coal:						
a. Area Sources	8	7	2	3	4	
b. Point Sources						
2. Distillate Oil:						
a. Area Sources	78	49	11	30	44	
b. Point Sources						
3. Residual Oil						
a. Area Sources						
b. Point Sources						
4. Natural Gas:						
a. Area Sources	0	0	0	0	0	
b. Point Sources						
5. Wood:						
a. Area Sources	111	288	54	200	322	
b. Point Sources						
6. Total	197	344	67	233	370	
B. Commercial and Institutional Fuel:						
1. Bituminous Coal:						
a. Area Sources	2	1	1	0	0	
b. Point Sources	0	0	0	0	0	
2. Distillate Oil:						
a. Area Sources	29	22	4	14	15	
b. Point Sources	0	0	0	0	0	
3. Residual Oil:						
a. Area Sources	3	2	0	2	2	
b. Point Sources	12	6	0	2	2	
4. Natural Gas:						
a. Area Sources						
b. Point Sources						
5. Total	46	31	5	18	19	

TABLE 4.8 (continued)
VERMONT
PARTICULATE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

	Counties					
urce Category	Orleans	Washington	Windham	Windsor	Region Total	
I. Fuel Combustion - stationary sources						
A. Residential Fuel:						
1. Bituminous Coal:						
a. Area Sources	8	19	12	17	80	
b. Point Sources						
2. Distillate Oil:						
a. Area Sources	41	121	84	102	560	
b. Point Sources						
3. Residual Oil						
a. Area Sources						
b. Point Sources						
4. Natural Gas:						
a. Area Sources	0	1	0		1	
b. Point Sources						
5. Wood:						
a. Area Sources	249	337	201	388	2150	
b. Point Sources						
6. Total	298	478	297	507	2791	
B. Commercial and Institutional Fuel:						
1. Bituminous Coal:						
a. Area Sources	1	1	1	2	9	
b. Point Sources	0	1	0		1	
2. Distillate Oil:						
a. Area Sources	19	57	12	40	212	
b. Point Sources	0	0	0	0	0	
3. Residual Oil:						
a. Area Sources	2	8	2	4	25	
b. Point Sources	0	31	21	3	77	
4. Natural Gas:						
a. Area Sources						
b. Point Sources						
5. Total	22	98	36	49	324	

TABLE 4.8 (continued)
VERMONT
PARTICULATE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties					
	Bennington	Caledonia	Essex	Lamoille	Orange	
C. Industrial Fuel:						
1. Bituminous Coal:						
a. Area Sources	3	3	0	2	2	
b. Point Sources	4	0	0	0	0	
2. Distillate Oil:						
a. Area Sources						
b. Point Sources		3				
3. Residual Oil:						
a. Area Sources	5	5	3	2	4	
b. Point Sources	17	4	9	8	0	
4. Natural Gas:						
a. Area Sources						
b. Point Sources						
5. Total	29	15	12	12	6	
. Steam-electric Power Plant Fuel (point sources only):						
1. Anthracite Coal						
2. Bituminous Coal						
3. Coke						
4. Distillate Oil						
5. Residual Oil						
6. Natural Gas						
7. Total						
. Total Stationary Fuel Combustion	272	390	84	263	395	
II. Process Losses:						
A. Area Sources						
B. Point Sources						
1. Chemical Process Industries	1					
2. Food & Agricultural Industries		29				
3. Metallurgical Industries		43				
4. Mineral Products Industries				929		
5. Petroleum Pefining & Petrochemical Operations	338	483	68	68		
6. Wood Processing	68	54	3750	24	55	
7. Petroleum Storage						
. Total Process Losses	407	609	3818	1021	55	

TABLE 4.8 (continued)
VERMONT
PARTICULATE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties					
	Orleans	Washington	Windham	Windsor	Region Total	
C. Industrial Fuel:						
1. Bituminous Coal:						
a. Area Sources	2	9	3	5	29	
b. Point Sources	0	0		146	150	
2. Distillate Oil:						
a. Area Sources			10	0	10	
b. Point Sources				4	7	
3. Residual Oil:						
a. Area Sources	3	10	10	12	54	
b. Point Sources	17	1	0	6	62	
4. Natural Gas:						
a. Area Sources						
b. Point Sources						
5. Total	22	20	23	173	312	
D. Steam-electric Power Plant Fuel (point sources only):						
1. Anthracite Coal						
2. Bituminous Coal						
3. Coke						
4. Distillate Oil				35	35	
5. Residual Oil						
6. Natural Gas						
7. Total				35	35	
E. Total Stationary Fuel Combustion	342	596	356	764	3462	
Process Losses:						
A. Area Sources						
B. Point Sources						
1. Chemical Process Industries					1	
2. Food & Agricultural Industries					29	
3. Metallurgical Industries		7		21	71	
4. Mineral Products Industries	1848	2		350	149197	
5. Petroleum Refining & Petrochemical Operations	68	131			1156	
6. Wood Processing	225	8	35	566	4785	
7. Petroleum Storage						
C. Total Process Losses	2141	148	35	937	155239	

TABLE 4.8 (continued)
VERMONT
PARTICULATE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties					
	Bennington	Caledonia	Essex	Lamoille	Orange	
II.Solid Waste Disposal:						
A. Incineration:						
1. On-site:						
a. Area Sources	3	2	1	1	2	
b. Point Sources						
2. Municipal, etc.:						
a. Area Sources						
b. Point Sources						
. Open Burning:						
1. On-site:						
a. Area Sources	211	164	39	96	127	
b. Point Sources						
Total Solid Waste Disposal	214	166	40	97	129	
V. Transportation (area sources only):						
A. Motor Vehicles						
1. Gasoline Powered	77	55	14	34	47	
2. Diesel Powered	3	2	0	1	1	
B. Off-highway Fuel Usage						
Aircraft						
D. Railroads	1	2	1	1	1	
Vessels						
Gasoline Handling Evaporative Losses						
G. Other (specify)						
Total Transportation	81	59	15	36	49	
. Grand Totals						
Area Sources	534	602	130	386	571	
. Point Sources	440	622	3827	1031	57	
Total	974	1224	3957	1417	628	

TABLE 4.8 . (continued)
VERMONT
PARTICULATE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties					
	Orleans	Washington	Windham	Windsor	Region Total	
III. Solid Waste Disposal:						
A. Incineration:						
1. On-site:						
a. Area Sources	2	5	3	4	23	
b. Point Sources						
2. Municipal, etc.:						
a. Area Sources						
b. Point Sources						
B. Open Burning:						
1. On-site:						
a. Area Sources	145	343	238	317	1680	
b. Point Sources						
. Total Solid Waste Disposal	147	348	241	321	1703	
I Transportation (area sources only):						
A. Motor Vehicles						
1. Gasoline Powered	31	94	94	17	463	
2. Diesel Powered	1	31	13	1	53	
B. Off-highway Fuel Usage						
. Aircraft						
D. Railroads	1	1	1	2	11	
E. Vessels						
. Gasoline Handling Evaporative Losses						
G. Other (specify)						
. Total Transportation	33	126	108	20	527	
V Grand Totals.						
. Area Sources	505	1037	684	911	5360	
. Point Sources	2158	181	56	1131	7655	
C. Total	2663	1218	740	2042	13015	

TABLE 4.9
VERMONT
SULFUR OXIDE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 159
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties					
	Chittenden	Addison	Franklin	Grand Isle	Rutland	Region Total
I. Fuel Combustion - Stationary sources						
A. Residential Fuel:						
1. Bituminous Coal:						
a. Area Sources	30	13	20	1	26	90
b. Point Sources						
2. Distillate Oil:						
a. Area Sources	1022	205	266	37	509	2039
b. Point Sources						
3. Residual Oil						
a. Area Sources						
b. Point Sources						
4. Natural Gas:						
a. Area Sources	0	0				
b. Point Sources						
5. Wood:						
a. Area Sources	7	9	13	2	8	39
b. Point Sources						
6. Total	1059	227	299	40	543	2168
B. Commercial and Institutional Fuel:						
1. Bituminous Coal:						
a. Area Sources	1	1	2	1	3	8
b. Point Sources	10	12	0	0	0	22
2. Distillate Oil:						
a. Area Sources	175	48	73	12	138	446
b. Point Sources	24	2	0	0	0	26
3. Residual Oil:						
a. Area Sources	60	16	28	4	47	155
b. Point Sources	379	146	162	0	200	887
4. Natural Gas:						
a. Area Sources						
b. Point Sources						
5. Total	649	225	265	17	388	1544

TABLE 4.9 (Continued)
VERMONT
SULFUR OXIDE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 159
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties					
	Chittenden	Addison	Franklin	Grand Isle	Rutland	Region Total
. Industrial Fuel:						
1. Bituminous Coal:						
a. Area Sources	6	2	3		7	18
b. Point Sources	9	25	0		0	34
2. Distillate Oil:						
a. Area Sources	6	2	2		6	16
b. Point Sources	12	3	0		5	20
3. Residual Oil:						
a. Area Sources	154	62	62	0	183	461
b. Point Sources	209	159	156	11	744	1279
4. Natural Gas:						
a. Area Sources						
b. Point Sources						
5. Total	396	253	223	11	945	1828
D. Steam-electric Power Plant Fuel (point sources only):						
1. Anthracite Coal						
2. Bituminous Coal	3338	0	0	0	0	3338
3. Coke						
4. Distillate Oil	89	7	8	0	69	173
5. Residual Oil	116					116
6. Natural Gas						
7. Total	3543	7	8	0	69	3627
. Total Stationary Fuel Combustion	5647	712	795	68	1945	9167
Process Losses:						
. Area Sources						
. Point Sources						
1. Chemical Process Industries						
2. Food & Agricultural Industries						
3. Metallurgical Industries						
4. Mineral Products Industries						
5. Petroleum Refining & Petrochemical Operations	29	25	1		2	57
6. Wood Processing	2	3	0	0	3	8
7. Petroleum Storage						
C. Total Process Losses	31	28	1	0	5	65

TABLE 4.9 (Continued)
VERMONT
SULFUR OXIDE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 159
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties					
	Chittenden	Addison	Franklin	Grand Isle	Rutland	Region Total
III. Solid Waste Disposal:						
A. Incineration:						
1. On-site:						
a. Area Sources	2	1	1	0	1	5
b. Point Sources						
2. Municipal, etc.:						
a. Area Sources						
b. Point Sources						
B. Open Burning:						
1. On-site:						
a. Area Sources	44	11	14	2	25	96
b. Point Sources						
C. Total Solid Waste Disposal	46	12	15	2	26	101
IV. Transportation (area sources only):						
A. Motor Vehicles						
1. Gasoline Powered	89	39	35	10	80	253
2. Diesel Powered	38	1	1	0	25	65
B. Off-highway Fuel Usage						
C. Aircraft	49					49
D. Railroads	24	4	10	0	12	50
E. Vessels	12	0	0	0	0	12
F. Gasoline Handling Evaporative Losses						
G. Other (specify)						
H. Total Transportation	212	44	46	10	117	429
V. Grand Totals						
A. Area Sources	1719	414	530	69	1070	3802
B. Point Sources	4217	382	327	11	1023	5960
C. Total	5936	796	857	80	2093	9762

TABLE 4.10
VERMONT
SULFUR OXIDE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties					
	Bennington	Caledonia	Essex	Lamoille	Orange	
Fuel Combustion - stationary sources						
A. Residential Fuel:						
1. Bituminous Coal:						
a. Area Sources	30	31	7	13	16	
b. Point Sources						
2. Distillate Oil:						
a. Area Sources	337	212	49	129	191	
b. Point Sources						
3. Residual Oil						
a. Area Sources						
b. Point Sources						
4. Natural Gas:						
a. Area Sources						
b. Point Sources						
5. Wood:						
a. Area Sources	6	16	3	11	18	
b. Point Sources						
6. Total	373	259	59	153	225	
B. Commercial and Institutional Fuel:						
1. Bituminous Coal:						
a. Area Sources	2	3	1	2	2	
b. Point Sources	0	0	0	0	0	
2. Distillate Oil:						
a. Area Sources	40	63	11	40	43	
b. Point Sources	0	3	0	0	0	
3. Residual Oil:						
a. Area Sources	45	50	6	25	23	
b. Point Sources	164	83	5	0	29	
4. Natural Gas:						
a. Area Sources						
b. Point Sources						
5. Total	251	202	23	67	97	

TABLE 4.10 (Continued)
VERMONT
SULFUR OXIDE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties					
	Orleans	Washington	Windham	Windsor	Region Total	
I. Fuel Combustion - Stationary sources						
A. Residential Fuel:						
1. Bituminous Coal:						
a. Area Sources	34	86	52	74	343	
b. Point Sources						
2. Distillate Oil:						
a. Area Sources	178	528	363	440	2427	
b. Point Sources						
3. Residual Oil						
a. Area Sources						
b. Point Sources						
4. Natural Gas:						
a. Area Sources						
b. Point Sources						
5. Wood:						
a. Area Sources	14	19	12	22	121	
b. Point Sources						
6. Total	226	633	427	536	2891	
B. Commercial and Institutional Fuel:						
1. Bituminous Coal:						
a. Area Sources	3	7	6	5	31	
b. Point Sources	0	0	0	0	0	
2. Distillate Oil:						
a. Area Sources	54	159	65	115	590	
b. Point Sources	0	1	1	0	5	
3. Residual Oil:						
a. Area Sources	29	84	36	61	359	
b. Point Sources	19	379	291	31	1001	
4. Natural Gas:						
a. Area Sources						
b. Point Sources						
5. Total	105	630	399	212	1986	

TABLE 4.10 (Continued)
VERMONT
SULFUR OXIDE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties				
	Bennington	Caledonia	Essex	Lamoille	Orange
C. Industrial Fuel:					
1. Bituminous Coal:					
a. Area Sources	6	3	0	2	2
b. Point Sources	2	1	0	0	0
2. Distillate Oil:					
a. Area Sources	45	1	0	0	0
b. Point Sources	0	8	1	0	0
3. Residual Oil:					
a. Area Sources	70	47	30	35	62
b. Point Sources	246	41	115	144	5
4. Natural Gas:					
a. Area Sources					
b. Point Sources					
5. Total	369	101	146	181	69
D. Steam-electric Power Plant Fuel (point sources only):					
1. Anthracite Coal					
2. Bituminous Coal					
3. Coke					
4. Distillate Oil					
5. Residual Oil					
6. Natural Gas					
7. Total					
E. Total Stationary Fuel Combustion	993	562	228	401	391
I. Process Losses:					
A. Area Sources					
B. Point Sources					
1. Chemical Process Industries					
2. Food & Agricultural Industries					
3. Metallurgical Industries					
4. Mineral Products Industries					
5. Petroleum Refining & Petrochemical Operations	0	1	1	1	0
6. Wood Processing	7	5	375	2	6
7. Petroleum Storage					
C. Total Process Losses	7	6	376	3	6

TABLE 4.10 (Continued)
VERMONT
SULFUR OXIDE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties					
	Orleans	Washington	Windham	Windsor	Region Total	
C. Industrial Fuel:						
1. Bituminous Coal:						
a. Area Sources	2	8	7	6	36	
b. Point Sources	0	0	0	77	80	
2. Distillate Oil:						
a. Area Sources	0	2	4	1	53	
b. Point Sources	0	0	0	17	26	
3. Residual Oil:						
a. Area Sources	40	173	145	151	753	
b. Point Sources	48	16	0	71	686	
4. Natural Gas:						
a. Area Sources						
b. Point Sources						
5. Total	90	199	156	323	1634	
Steam-electric Power Plant Fuel (point sources only):						
1. Anthracite Coal						
2. Bituminous Coal						
3. Coke						
4. Distillate Oil				33	33	
5. Residual Oil						
6. Natural Gas						
7. Total				33	33	
Total Stationary Fuel Combustion	421	1462	982	1104	6544	
II. Process Losses:						
A. Area Sources						
B. Point Sources						
1. Chemical Process Industries						
2. Food & Agricultural Industries						
3. Metallurgical Industries						
4. Mineral Products Industries						
5. Petroleum Refining & Petrochemical Operations	1	0	0	0	4	
6. Wood Processing	23	1	4	57	480	
7. Petroleum Storage						
Total Process Losses	24	1	4	57	484	

TABLE 4.10 (Continued)
VERMONT
SULFUR OXIDE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties					
	Bennington	Caledonia	Essex	Lamoille	Orange	
III. Solid Waste Disposal:						
A. Incineration:						
1. On-site:						
a. Area Sources	1	1	0	0	0	
b. Point Sources						
2. Municipal, etc.:						
a. Area Sources						
b. Point Sources						
B. Open Burning:						
1. On-site:						
a. Area Sources	13	10	2	6	8	
b. Point Sources						
C. Total Solid Waste Disposal	14	11	2	6	8	
IV. Transportation (area sources only):						
A. Motor Vehicles						
1. Gasoline Powered	44	32	9	19	29	
2. Diesel Powered	6	4	0	3	4	
B. Off-highway Fuel Usage						
C. Aircraft						
D. Railroads	4	4	3	4	3	
E. Vessels	0	0	0	0	0	
F. Gasoline Handling Evaporative Losses						
G. Other (specify)						
H. Total Transportation	54	40	12	26	36	
Grand Totals.						
A. Area Sources	649	477	121	289	401	
B. Point Sources	419	142	497	147	40	
C. Total	1068	619	618	436	441	

TABLE 4.10 (Continued)
VERMONT
SULFUR OXIDE EMISSIONS INVENTORY SUMMARY, TONS/YEAR
AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Category	Counties					
	Orleans	Washington	Windham	Windsor	Region Total	
II.Solid Waste Disposal:						
A. Incineration:						
1. On-site:						
a. Area Sources	4	1	1	1	9	
b. Point Sources						
2. Municipal, etc.:						
a. Area Sources						
b. Point Sources						
B. Open Burning:						
1. On-site:						
a. Area Sources	9	23	15	20	106	
b. Point Sources						
C. Total Solid Waste Disposal	13	24	16	21	115	
IV. Transportation (area sources only):						
A. Motor Vehicles						
1. Gasoline Powered	19	56	59	11	278	
2. Diesel Powered	2	56	23	1	99	
B. Off-highway Fuel Usage						
C. Aircraft						
D. Railroads	2	5	6	5	36	
E. Vessels	0	0	0	0	0	
F. Gasoline Handling Evaporative Losses						
G. Other (specify)						
H. Total Transportation	23	117	88	17	413	
. Grand Totals						
A. Area Sources	390	1207	794	913	5241	
B. Point Sources	91	397	296	286	2315	
C. Total	481	1604	1090	1199	7556	

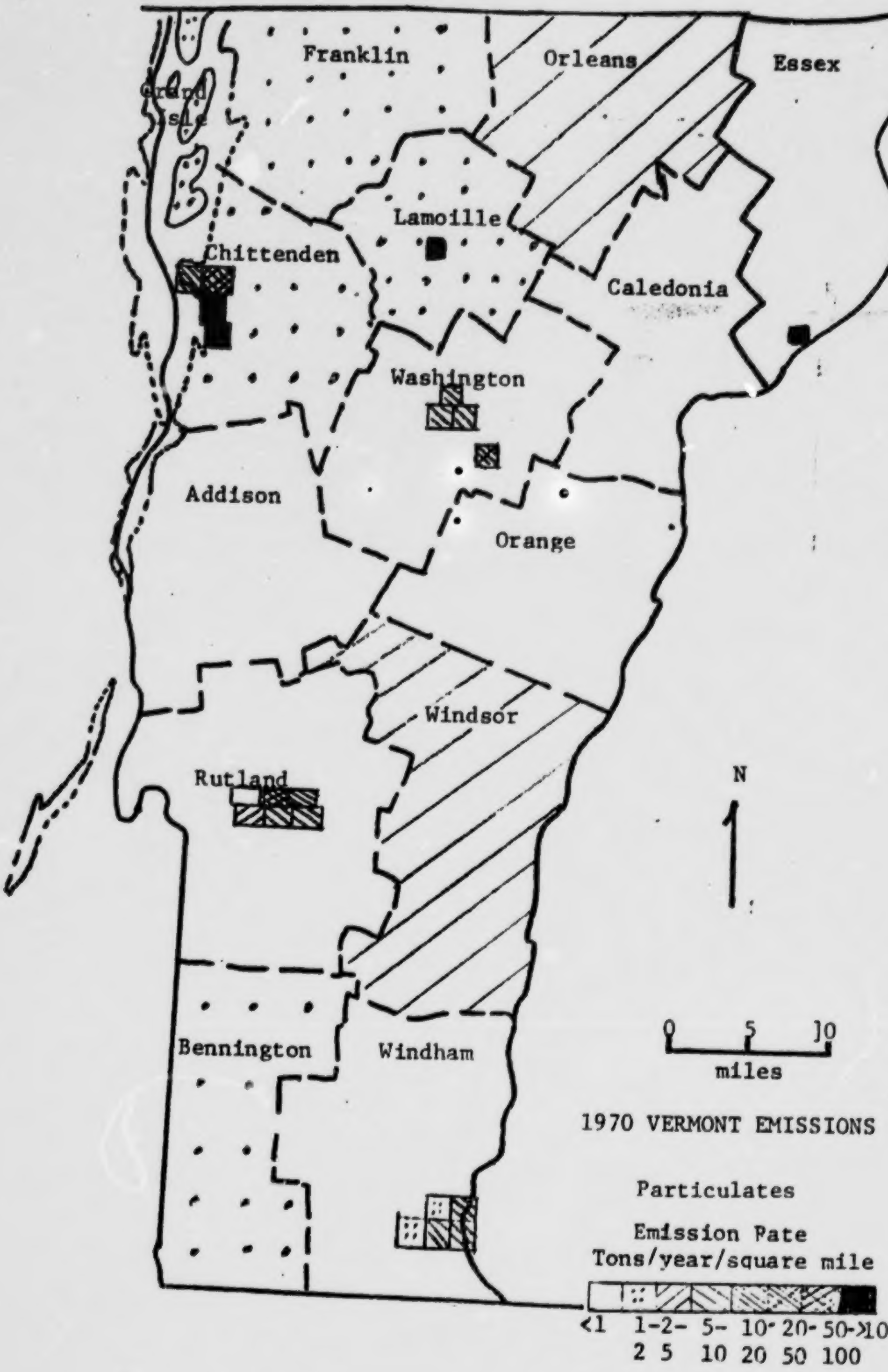

Franklin
Orleans
Essex
Grand Isle
Lamoille
Chittenden
Caledonia
Washington
Addison
Orange
Windsor
Rutland
N
0 5 10
miles
Bennington
Windham
1970 VERMONT EMISSIONS
Particulates
Emission Rate
Tons/year/square mile
<1
1-2
2-5
5-10
10-20
20-50
50-100
>100

Figure 4.6

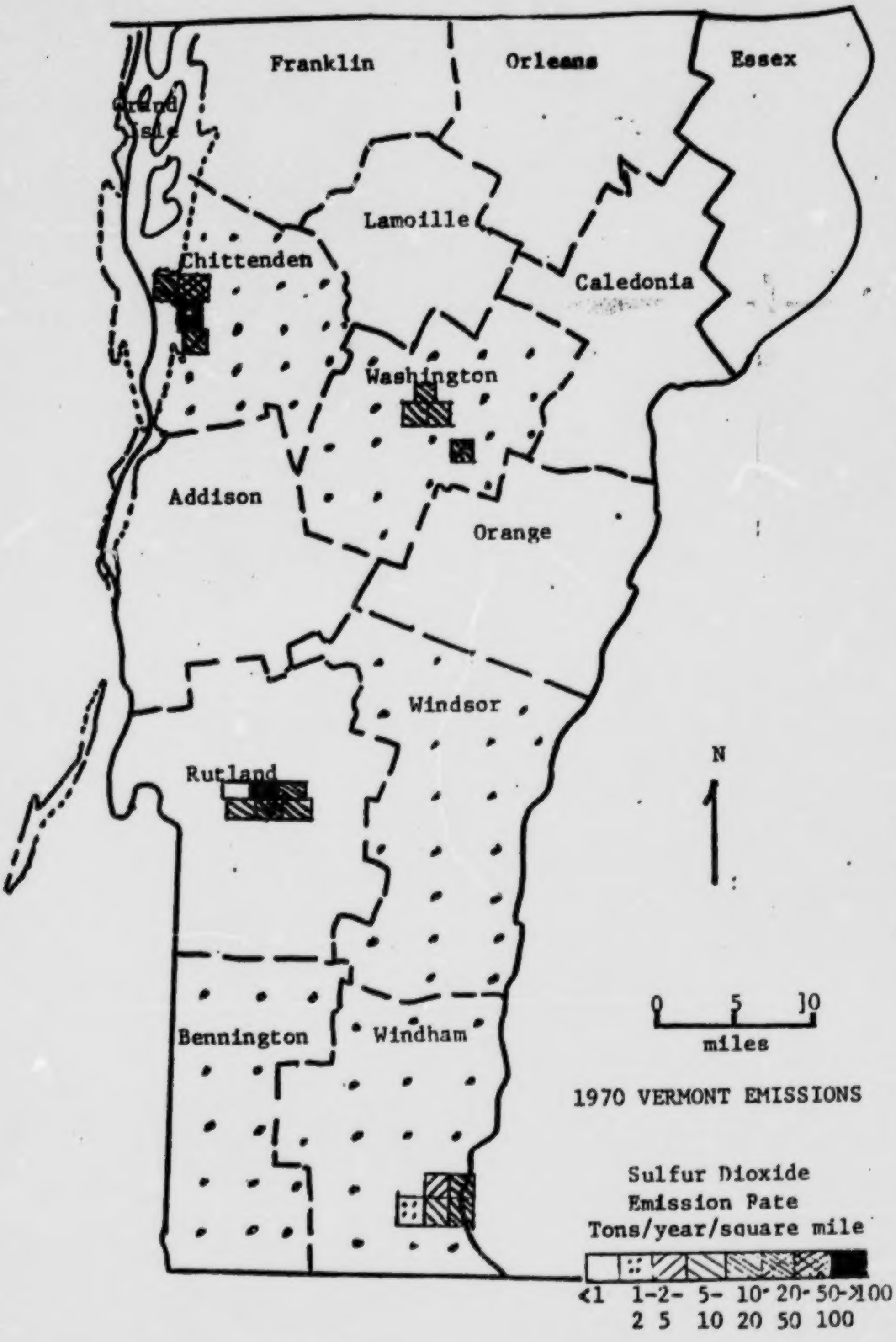

Franklin
Orleans
Essex
Grand Isle
Lamoille
Chittenden
Caledonia
Washington
Addison
Orange
Windsor
Rutland
N
Bennington
Windham
0 5 10
miles
1970 VERMONT EMISSIONS
Sulfur Dioxide
Emission Rate
Tons/year/square mile
<1 1-2- 5- 10- 20- 50- >100
2 5 10 20 50 100

Figure 4.7

4.2.3 Emissions of Carbon Monoxide, Hydrocarbons and Nitrogen Dioxide

Current emissions of the pollutants carbon monoxide, nitrogen dioxide and hydrocarbons are listed in the following tables in the format specified by EPA regulations and illustrated in Figures 4.8, 4.9 and 4.10.

TABLE 4.11
CARBON MONOXIDE EMISSIONS SUMMARY (TONS/YEAR)
VERMONT AIR QUALITY CONTROL REGION 159
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

	Counties				
Source Category	Addison	Chittenden	Franklin	Grand Isle	Rutland
I Fuel Combustion - Stationary Sources					
A. Area	53	158	65	10	115
B. Point	96	123	58	0	6
C. Total	149	281	123	10	121
II Process Losses					
A. Area	0	0	0	0	0
B. Point	0	0	0	0	138
C. Total	0	0	0	0	138
III Solid Waste Disposal					
A. Area	932	3800	1205	138	2022
B. Point					
C. Total	932	3800	1205	138	2022
IV Transportation Area	13265	39964	11675	3591	34256
V Miscellaneous Area	0	0	0	0	0
VI Grand Totals					
A. Area	14250	43922	12945	3739	36393
B. Point	96	123	58	0	144
C. Total	14346	44045	13003	3739	36537

TABLE 4.12
NITROGEN DIOXIDE EMISSIONS SUMMARY (TONS/YEAR)
VERMONT AIR QUALITY CONTROL REGION 159
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

	Counties				
Source Category	Addison	Chittenden	Franklin	Grand Isle	Rutland
I Fuel Combustion - Stationary Sources					
A. Area	207	624	289	40	450
B. Point	187	978	182	3	347
C. Total	394	1602	471	43	797
II Process Losses					
A. Area	0	0	0	0	0
B. Point	0	0	0	0	0
C. Total	0	0	0	0	0
III Solid Waste Disposal					
A. Area	67	272	86	10	144
B. Point					
C. Total	67	272	86	10	144
IV Transportation Area	2259	5256	1979	612	4700
V Miscellaneous Area	0	0	0	0	0
VI Grand Totals					
A. Area	2533	6152	2354	662	5294
B. Point	187	978	182	3	347
C. Total	2720	7130	2536	665	5641

TABLE 4.13
HYDROCARBON EMISSIONS SUMMARY (TONS/YEAR)
VERMONT AIR QUALITY CONTROL REGION 159
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

	Counties				
Source Category	Addison	Chittenden	Franklin	Grand Isle	Rutland
I Fuel Combustion - Stationary Sources					
A. Area	34	97	45	7	61
B. Point	25	53	27	0	21
C. Total	59	150	72	7	82
II Process Losses					
A. Area	182	738	235	27	394
B. Point	21	0	0	0	0
C. Total	203	738	235	27	394
III Solid Waste Disposal					
A. Area	330	1340	425	48	714
B. Point					
C. Total	330	1340	425	48	714
IV Transportation Area	2541	7064	2237	687	6109
V Miscellaneous Area	127	280	111	35	274
VI Grand Totals					
A. Area	3214	9519	3053	804	7552
B. Point	46	53	27	0	21
C. Total	3260	9572	3080	804	7573

TABLE 4.14
CARBON MONOXIDE EMISSIONS SUMMARY (TONS/YEAR)
VERMONT INTRASTATE AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

	Counties								
Source Categories	Bennington	Caledonia	Essex	Lamoille	Orange	Orleans	Washington	Windham	Windsor
I Fuel Combustion - Stationary									
A. Area Sources	77	70	16	41	59	65	151	95	135
B. Point Sources	5	5	250	2	3	15	1	3	39
C. Total	82	75	266	43	62	80	152	98	174
II Process Losses									
A. Area Sources	0	0	0	0	0	0	0	0	0
B. Point Sources	900	326	0	0	0	0	51	0	158
C. Total	900	326	0	0	0	0	51	0	158
III Solid Waste Disposal									
A. Area Sources	1124	874	208	511	678	774	1827	1271	1691
B. Point Sources	0	0	0	0	0	0	0	0	0
C. Total	1124	874	208	511	678	774	1827	1271	1691
IV Transportation Area Sources	16049	11449	2894	7053	9680	6453	23802	21786	3492
V Miscellaneous Area Sources									
VI Grand Totals									
A. Area Sources	17250	12393	3118	7605	10417	7292	25780	23152	5318
B. Point Sources	905	331	250	2	3	15	52	3	197
C. Total	18155	12724	3368	7607	10420	7307	25832	23155	5515

TABLE 4.15
NITROGEN DIOXIDE EMISSIONS SUMMARY (TONS/YEAR)
VERMONT INTRASTATE AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Categories	Counties								
	Bennington	Caledonia	Essex	Lamoille	Orange	Orleans	Washington	Windham	Windsor
I Fuel Combustion - Stationary									
A. Area Sources	280	274	56	176	250	232	546	301	473
B. Point Sources	102	57	1274	37	24	120	87	68	314
C. Total	382	331	1330	213	274	352	633	369	787
II Process Losses									
A. Area Sources	0	0	0	0	0	0	0	0	0
B. Point Sources	0	0	0	0	0	0	0	0	0
C. Total	0	0	0	0	0	0	0	0	0
III Solid Waste Disposal									
A. Area Sources	80	62	15	37	49	55	130	91	121
B. Point Sources	0	0	0	0	0	0	0	0	0
C. Total	80	62	15	37	49	55	130	90	121
IV Transportation Area Sources	2739	1955	508	1205	1652	1103	3460	3460	600
V Miscellaneous Area Sources									
VI Grand Totals									
A. Area Sources	3099	2291	579	1418	1951	1390	4136	3851	1194
B. Point Sources	102	57	1274	37	24	120	87	68	314
C. Total	3201	2348	1853	1455	1975	1510	4223	3919	1508

TABLE 4.16
HYDROCARBON EMISSIONS SUMMARY (TONS/YEAR)
VERMONT INTRASTATE AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1970

Source Categories	Counties								
	Bennington	Caledonia	Essex	Lamoille	Orange	Orleans	Washington	Windham	Windsor
I Fuel Combustion - Stationary									
A. Area Sources	44	47	9	30	44	41	92	53	84
B. Point Sources	9	6	251	3	3	17	5	6	43
C. Total	53	53	260	33	47	58	97	59	127
II Process Losses									
A. Area Sources	439	342	81	200	265	302	716	496	661
B. Point Sources	0	0	0	0	0	0	0	0	35
C. Total	439	342	81	200	265	302	716	496	696
III Solid Waste Disposal									
A. Area Sources	396	308	73	181	240	273	645	449	597
B. Point Sources	0	0	0	0	0	0	0	0	0
C. Total	396	308	73	181	240	273	645	449	597
IV Transportation Area Sources	3066	2188	560	1347	1849	1232	4224	4023	669
V Miscellaneous Area Sources	219	156	43	96	131	88	248	286	48
VI Grand Totals									
A. Area Sources	4164	3041	766	1854	2529	1936	5925	5307	2059
B. Point Sources	9	6	251	3	3	17	5	6	78
C. Total	4173	3047	1017	1857	2532	1953	5930	5313	2137

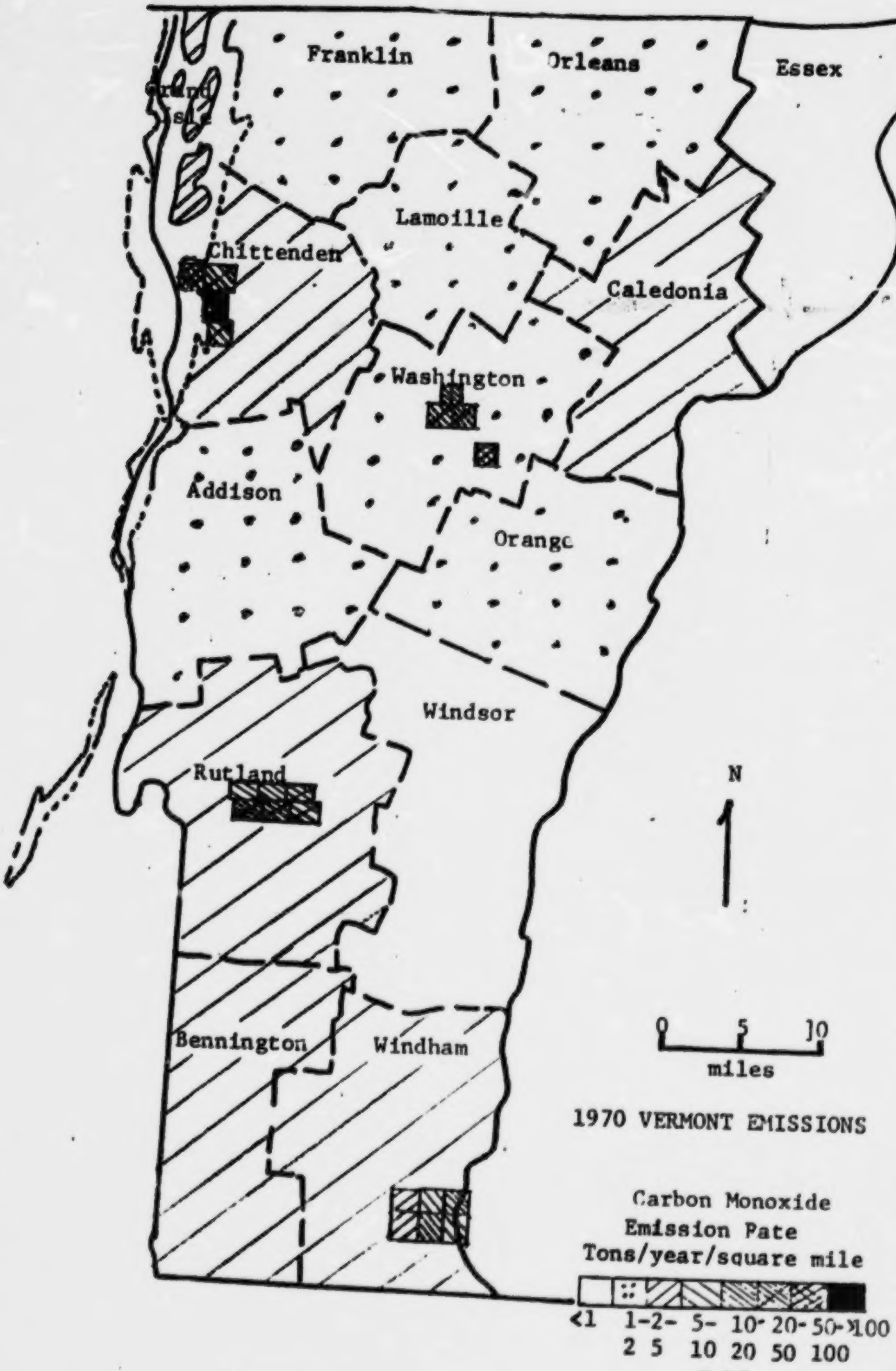
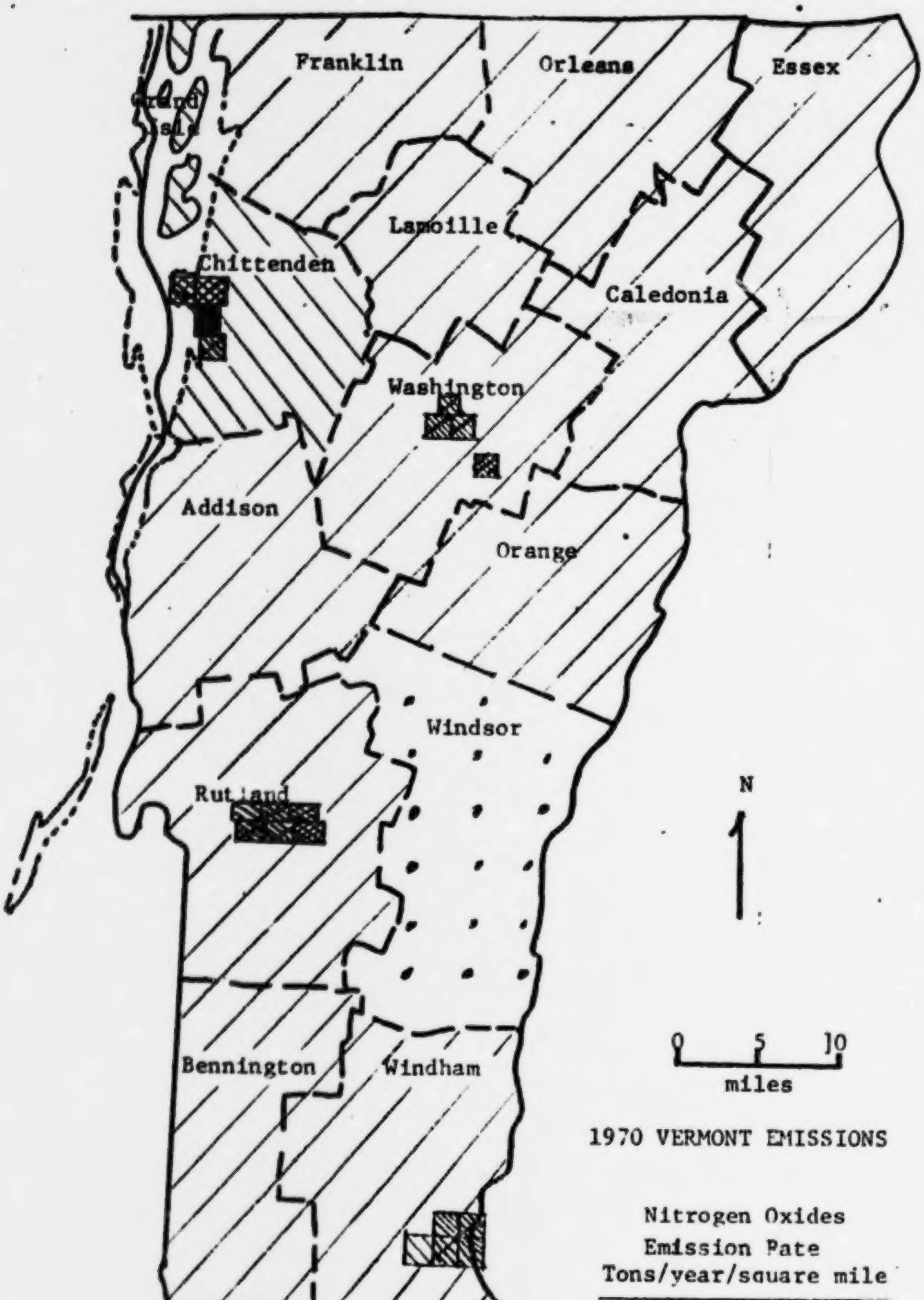

Franklin
Orleans
Essex
Grand Isle
Lamoille
Chittenden
Caledonia
Washington
Addison
Orange
Windsor
Rutland
Bennington
Windham
N
0 5 10
miles
1970 VERMONT EMISSIONS
Carbon Monoxide
Emission Rate
Tons/year/square mile
<1
1-2
2-5
5-10
10-20
20-50
50-100
>100
X 10

Figure 4.8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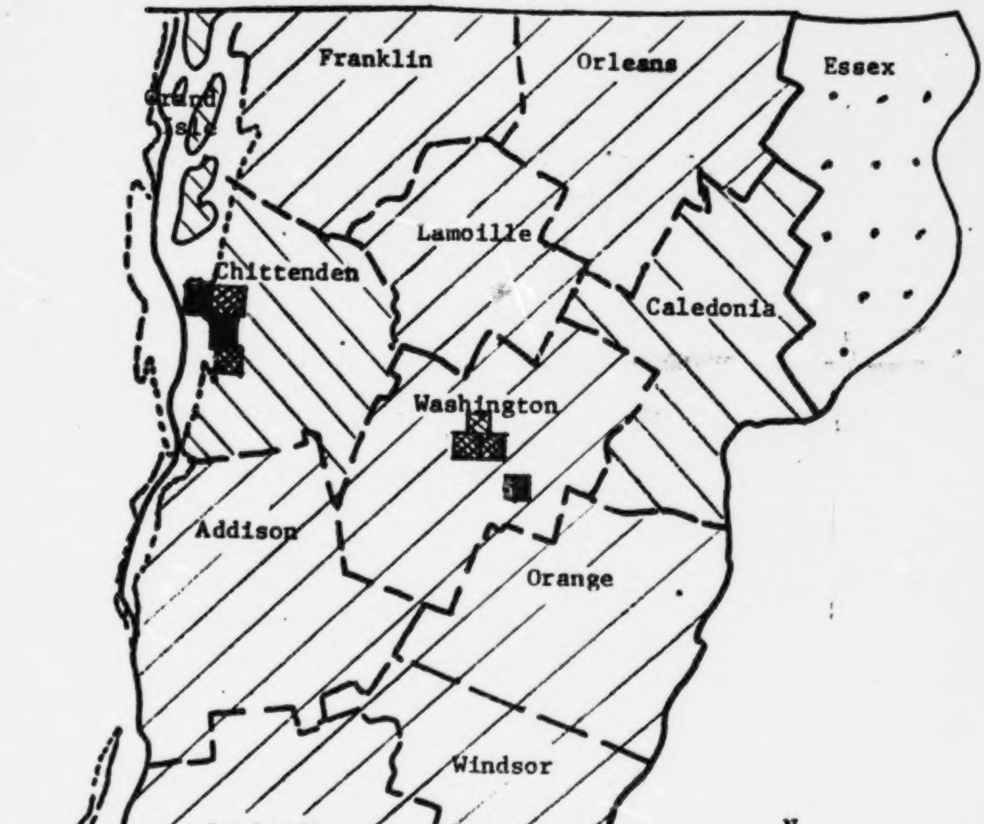
Lamoille
Chittenden
Caledonia
Washington
Addison
Orange
Windsor
Rutland
N
Bennington
Windham
0 5 10
miles
1970 VERMONT EMISSIONS
Nitrogen Oxides
Emission Rate
Tons/year/square mile
<1
1-2
2-5
5-10
10-20
20-50
50-100
>100

Figure 4.9


Franklin
Orleans
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Grand Isle
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Chittenden
Caledonia
Washington
Addison
Orange
Windsor
Rutland
Bennington
Windham
N
0 5 10
miles
1970 VERMONT EMISSIONS
Hydrocarbons
Emission Rate
Tons/year/square mile
<1
1-2
2-5
5-10
10-20
20-50
50-100
>100

Figure 4.10

4.2.4 Methodology of Inventory

The overall methodology used in the Vermont air pollution emission inventory centered on correctly apportioning the various types of fuels, process emissions, and combustible solid waste. The State of Vermont contains two Air Quality Control Regions. The results of the inventory were presented to show regional, county totals and a state total. Totals for all types of fuels and solid waste were apportioned according to population and applicable land use variables in each region. Once subtotals had been established for fuels and solid waste for regions 159 and 221, the quantities reported by fuel burning "point sources" were subtracted to determine the quantities of fuel available for area source apportioning. Process emissions were obtained only from returned questionnaires. All types of industrial wood burning operations were entered under point source totals.

For Vermont, a point source was defined as one that had fuel burning operations that emitted over 10 tons/year of any one of the five pollutants or was in one of the special SIC categories (SIC 2000, 2200, 2600, 2800, 2900, 3200, 3300, 3400). Fuel burning operations that consumed 139 tons/year of 9.0% ash, 2.0% S coal; 53,694 gallons/year of 2.0% S residual oil; 469,483 gallons/year of .3% S distillate oil; or 266 x 10^6 ft.^{3} of normal natural gas would produce, respectively, 10 tons per year of particulate (coal), sulfur oxides (residual oil), sulfur oxides (distillate oil) and nitrogen oxides (natural gas). This limit of 10 tons pollutant per year was relaxed in a number of cases to include sources that emitted less than 10 tons per year, in order to effect a balance between point and area sources. This was due to the preponderance of small sources in Vermont, where even a 10 ton threshold excludes too many.

All area and point source information was either collected or broken down to a county or political jurisdiction basis. In four areas in Vermont, certain towns were further broken into "grid squares." The "grid squares" in a county reflect the typical New England congregation of residential and industrial sources. These grids indicated the greater emission density that could lead to high atmospheric concentrations over a localized area.

In order to obtain a yearly plus two seasons breakout for the Vermont Inventory, a number of assumptions and decisions were made.

- o From Vermont climatological summaries the 30 year average indicated that 85% of the degree days occurred in the 6 month, November thru April period and 15% of the degree days occurred in the 6 month, May thru October time period. Degree day information for calendar year 1970 was not available so the 30 year average was used.
- o All area source heating emissions were assumed to be proportional with degree days except for residential heating where Bierbaum suggested a 10% base load for hot water heating.
- o Point source emissions were broken down to whether it was process or space heating. It was assumed utilities were evenly split between the two seasons because only a yearly fuel total was supplied.
- o Asphalt batch plants were assumed to only operate in the summer season.

The questionnaires sent out by the Air Pollution Control Program asked for a fuel breakout by the month. There was some confusion by a number of sources in reporting fuel actually used or just billed for each month. Where "point sources" indicated fuel usage in each month, those totals were used as reported in the appropriate tally. For "point sources" that did not correctly fill out the questionnaire, a straight proportion between degree days and emissions for space heating was used. Process emissions and fuel burning emissions for process were entered under the correct season.

Area Source Emissions

Estimation of area source emissions for the two regions in Vermont relied upon many of the techniques outlined by Bierbaum. In many cases specific information for the calendar year 1970 was not available and estimates had to be made on information previously obtained.

To facilitate the explanation of the reported fuel tallies, process emissions and combusted solid waste, the discussion will focus on one fuel or category at a time with reference to EPA Source Category Totals Input Sheets, Tables I, II, and III.

Coal

The Bituminous Coal and Lignite Distribution for 1970 listed a four state industrial and commercial total of 1,071,000 tons for Vermont, Maine, New Hampshire and Rhode Island. Eleven years of data on soft coal (Bituminous) show a general 22% decrease in coal use per year. The problem was to update previous breakouts of industrial and retail coal distribution and use the proper Vermont proportion of the four state industrial and commercial coal.

The breakout on hard coal (anthracite) showed 43% of the four state total going to Vermont. It was therefore assumed that 43% of the soft coal is sold in Vermont. A review of Table 42 of the Minerals Yearbook updated to 1970 gives 13,400 tons for retail soft coal -- that going to both commercial establishments and homes. Applying the 43% Vermont proportion, we obtain a total of 5800 tons retail soft coal.

When the anthracite coal is updated to 1970, to compensate for the yearly decrease, we find 22,000 tons of hard coal for Vermont. Of this, 44% or 9600 tons is retail. Hence the total soft and hard coal for Vermont retail is 15,400 tons, which must be divided between commercial and residential.

In 1960 there were 13,600 dwelling units using coal. The 22% decrease was applied, obtaining 1130 dwelling units using coal by 1970. A back-calculation was performed using 7870 degree days for Vermont, 5 1/2 rooms versus 5 room national average homes, and a factor of 1.2×10^{-3} per degree day ton for an average dwelling unit. This calculation provides 11,700 tons of soft and hard coal needed for Vermont dwelling units. This value subtracted from the total retail coal of 15,400 tons leaves 3,700 tons available for commercial apportionment. The apportioning was distributed throughout each county by number of commercial establishments in each county.

For industrial soft coal, there was reported in the Minerals Yearbook a total of 141,000 tons for 1968 for the four states. The 43% Vermont proportion is 86,000 tons, and updated to 1970 to account for the yearly decrease, the available soft coal is 37,000 tons. Hard coal for Vermont totals 35,800 tons for 1968. This is updated by applying the 22% per year factor, or 22,000 tons, as before. But 44% is for retail, so the 56% available for industry is 12,400 tons. We add this to the 37,000 tons of soft coal and obtain a total industrial coal usage of 49,400 tons. Reports from point sources resulted in 57,000 tons being used. The difference in these two numbers can be accounted for by assuming coal is shipped into Vermont after being sold elsewhere. However, since all the available soft and hard coal is more than accounted for by point sources, no area source industrial coal remains for apportioning.

The book "Combustion Engineering," Glenn R. Fryling M. E., was used to determine that coal shipped to Vermont was 9% ash and 2% sulfur by weight.

Residual and Distillate Oil

The Bureau of the Mines publication of Sales of Fuel Oil and Kerosine in 1969 provided the major input for fuel oil calculations. The Bureau of

Mines tally lists 9 separate categories depicting various uses of both distillate and residual. Since data for 1970 had not been compiled at the time of the inventory a growth estimate of 5% was used. This was based on the overall 1968 to 1969 increase.

For residential oil usage, the problem was to identify numbers of occupied dwelling units using oil burners. From census data it was determined that there were 110,732 dwelling units in 1960, and 149,101 units in 1970, an increase of 38,369. We noted above that 13,600 units used coal in 1960 and 1130 units used coal in 1970, so there were 12,470 units that converted to gas and oil. These conversions, added to the decade increase of 38,369 units means a total of 50,839 additional units are available for oil and gas usage.

The homes using gas were back-calculated, providing a number of units for 1970 equal to 4,700, minus the original 1960 users of gas of 552 units, leaves about 4150 who switched to gas.

The amount of oil was calculated from the number of dwelling units using oil, the BTU per average home factor, the 7,871 degree days for Vermont, and the average Vermont home rooms (5.5) ratio to the national average (5.0) to obtain 206,200,000 gallons of distillate fuel oil for dwelling units. This figure was then apportioned by oil burning homes in each county, gridded area and region.

The distillate commercial area source total was determined by adding together the Bureau of Mines Kerosine, Heating oil, Military and "Other" categories, and then subtracting the amount used under the domestic category and that reported by commercial distillate point sources.

The distillate industrial area source category was determined by adding together the Bureau of the Mines, Industrial, Oil Company and Electric categories and then subtracting the industrial and utility distillate oil used by point sources.

The EPA categories of Railroads, Vessels and Diesel Motor Vehicles were taken directly from the Bureau of the Mines tallies. Since no point source was recorded under these categories, the total amount was entered under the area source categories.

A total commercial and industrial residual oil usage from the Bureau of the Mines tally was determined. The combined 40,042,000 gallons break out to 27,337,000 gallons commercial and industrial point sources (as obtained from the questionnaires) and 12,705,000 gallons for commercial and industrial area sources. Total industrial fuel oil usage is 24,536,000 gallons of which about 14,930,000 gallons were for the point sources. This left a little better than 9,000,000 gallons for area industrial sources, which when subtracted from the total of 12,705,000 gallons assignable to total commercial and industrial area sources, leaves 3,000,000 gallons for commercial area sources.

Commercial, Institutional and Industrial area source emissions were apportioned by region, county and grid according to the number of non-point source establishments. From the 1967 Census Reports the total number of establishments was determined by county and in some cases by towns. From these was subtracted the total number of establishments that were considered point sources located in the appropriate counties and towns.

From fuel dealer reports it was determined that the residual oil was 2% sulfur by weight and the distillate oil was 0.3% sulfur, by weight.

Natural and Bottled Gas

The State of Vermont has only one gas company with a pipeline that extends to Chittenden and Franklin counties. Essentially the gas company serves the needs of the greater Burlington area. However, the 1960 Bureau of the Census reports that a number of dwelling units in every county are either heated with bottled or natural gas. The gas company in Burlington indicated that 2/3 of the total gas was distributed in Chittenden County and 1/3 in Franklin County in 1970. Industrial usage was 1,176 million cu. ft., Commercial usage 390 million cu. ft., and Domestic usage 903 million cu. ft. Industrial point sources in the Burlington area reported a total of 1,138 million cu. ft.

In addition to natural gas, there are 646 dwelling units in Region 159 using bottled gas and 1454 units in Region 221 using bottled gas. These account for 1 ton of particulates and 4 tons of nitrogen oxides for Region 159 (to be divided among five counties) and 4 1/2 tons of particulates, 4 1/2 tons of carbon monoxide and 14 1/2 tons of nitrogen oxides for Region 221 (to be divided among nine counties). While the number of homes in each county using bottled gas is known, and apportionment is made on this basis, it is felt that round off errors in the computer program relegate this category of emissions to negligible quantities and therefore these totals were not entered onto the computer printout.

The commercial gas was assumed to have been burned within the 2 counties with 2/3 apportioned to Chittenden County and 1/3 apportioned to Franklin County. There were no commercial point sources that reported gas usage.

The industrial area source category was assumed to be entirely within the two counties. A substantial portion of the gas was reported consumed by point sources. The remainder of the gas was apportioned 2/3 in Chittenden County and 1/3 in Franklin County for industrial area sources.

Domestic and "Other" Wood Burning

The 1960 Bureau of Census indicated the number of dwelling units by county that used wood for space heating. Since 1970 data was not available at the time of the inventory, it was assumed that the addition of wood burning dwelling units was minimal and the 1960 data was used. Estimates were made for the domestic consumption of wood using a modified "Bierbaum" technique. The procedure involved determining the ratio of heat content of coal versus wood. This ratio was then multiplied by the "Bierbaum" calculated number to result in the number of tons of wood. A value of 21.0×10^6 BTU per cord was found in the EPA emission factor book. The average heat content of wood is 7500 to 11,000 BTU/lb. A cord of wood weighs approximately 1 to 3 tons depending on how tightly it is packed and whether it is soft or hard wood. For purposes of the inventory 2 tons per cord was used. Most likely this number is high and area source emissions due to wood burning are probably high.

A number of industrial establishments indicated wood burning for both space heating and actual disposal through incineration of wood wastes. Any source that emitted more than 1 ton per year of particulates from wood burning was put into the point source tally. Industrial wood burning operations accounted for almost 1/2 of all the particulate emissions for all types point source fuel combustion and 1/4 of all the particulate when considering both "area" and "point" source fuel combustion.

Open Burning and Incineration

There are no municipal incinerators in Vermont. From the report compiled by the Vermont Solid Waste Division, it was determined that approximately 400,000 tons of solid waste were disposed of during 1970. It was assumed that all of this was burned either in backyards or in local dumps. These emissions were apportioned according to population by region, county and gridded. These emissions are probably on the high side because the 400,000 tons reflects the national average of 5.5 lbs. per person per day of disposable waste. Also, the prohibition of open burning by commercial and industrial establishments was begun in April of 1970 and was fully instrumented by January 1, 1971. This would most likely cause a portion of the solid waste to be landfilled.

The estimate was made for commercial and industrial incineration of solid waste based on .15 lbs. per person per day. These emissions were apportioned by region, county and gridded area on the basis of 1970 population estimates.

Hydrocarbon Evaporation

The emissions in this category were based on EPA supplied data of 30 lbs. per person per year for solvent evaporation. The population was listed by county and gridded areas, and was multiplied by 30/2000 to obtain tons per year. However, Vermont's use of hydrocarbon solvents is most likely well below the average 30 lbs. per person per year. The conspicuous absence of dry cleaning establishments and only one point source reporting emissions of over 1 ton for the calendar year 1970 indicate Vermont's much lower than average solvent use. Before consideration of hydrocarbon legislation due to solvent use, figures based on actual Vermont consumption would have to be determined.

Diesel Vessels

All the vessel traffic was assumed to be in the port of Burlington. The grid squares bordering the lake were apportioned according to apparent docking facilities.

Railroads

From the Bureau of Mines Report, total fuel usage by railroads was determined. Track mileage was roughly measured from the available maps. It was assumed that a quarter of all rail emissions occurred in the port areas of Burlington. In other gridded areas it was assumed that 1/2 of the county total would fall into a few certain grids, according to where tracks were indicated on Coast and Geodetic survey maps.

Diesel Motor Vehicles

From the Bureau of the Mines tally a fuel consumption of 7,602,000 gallons was indicated for both on-highway and off-highway use. This total was apportioned by region, county and gridded area in direct proportion to gasoline motor vehicle mileage counts.

Gasoline Motor Vehicles and Gasoline Evaporation

The State Highway Department in Vermont was able to supply a total driving mileage figure of 2,687,800,000 for the entire state, of which they estimated 95% of the driven mileage was rural and 5% was urban. The State Tax Department was able to supply total gallonage figures sold in each county and in the gridded towns. Total mileage divided by total gallonage results in an average of 12.5 miles per gallon. The Emission Factor Book suggested using 12.5 MPG to estimate vehicle miles. Table I required estimating vehicle-miles at both 25 MPH and 45 MPH. With the information available it was assumed that the 95% of the miles driven is rural and corresponds to the

45 MPH category. The 5% urban miles would correspond to the 25 MPH category. It was assumed that all the mileage driven in the gridded areas (urban) was in the 25 MPH category. From the gallonage numbers available by county and the four gridded areas, the miles driven were computed. The total number of miles driven in each category was summed by region. The miles driven were apportioned by dividing each county and gridded area total by the total for the region.

The Emission Factor Book suggested a figure of 20 lbs/1000 gallons to be used to estimate hydrocarbon emissions from gasoline handling and marketing. The emissions were apportioned according to the Tax Department's breakout of gallonage per county and town. The numbers entered as apportioning factors were the actual number of gallons divided by 100 for input purposes.

Additional Emissions

Under the hand-calculated portion of Chittenden County, political jurisdiction 09, the estimated emissions from Burlington Airport were listed. These emissions were based on landing and take-off cycles of the mix of planes that serves the Burlington Airport.

In counties where there are gridded areas, the county sum and the gridded sum must be added together to obtain totals for a county. The county total as listed by political jurisdiction (county identification without grid coordinates) is really the remainder of the county outside the gridded area.

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4.2.5 Proportional Model

It is necessary to demonstrate the adequacy of the control strategy for suspended particulates and sulfur dioxide in the areas of interest. In this case the areas of interest are those where concentration measurements were obtained and they correspond to the areas of maximum pollutant emissions. The device used here is the proportional modeling technique. The degree of improvement needed to attain an air quality standard is given by

$$\frac{A-C}{A-B} \times 100 = \text{percent reduction needed} \tag{2}$$

where A = existing air quality measured at the location of highest concentration

B = Background concentration

C = Standard to be attained.

Equation (1) is a rearranged version of (2) to calculate allowable emission rates directly for the areas affected.

The proportional model does not account for topography, spatial distribution of emissions or stack height. The strategy adopted, that is the Vermont emissions regulations, does not allow credit for stack height. The terrain is so irregular in Vermont that the effectiveness of high stacks is minimized. This fact was recognized in the promulgation of emissions regulations and accounts for emissions limitations on the basis of heat input for boilers and process emissions based on weight of material processed.

Calculations performed to generate allowable emissions to meet National Secondary standards for particulates and sulfur dioxide are shown below. Eq. (1) was used, i.e.

$$PE = \frac{CE\ (AQs-B)}{Max(AQ)-B} \tag{1}$$

Equation (1) is a form of equation (2) that introduces the current emissions to generate permissible emissions directly.

Particulates were all based on 30 micrograms per cubic meter background and the secondary standard for annual geometric mean concentration of 60 micrograms per cubic meter.

$$\text{Burlington} \quad PE = \frac{60-30}{70.5-30} \quad 5854 = 4336 \ \text{Tons/year}$$

$$\text{Barre} \quad PE = \frac{60-30}{55-30} \quad 416 = 499 \ \text{Tons/year}$$

(note that Barre already meets the air quality standard)

$$\text{Brattleboro} \quad PE = \frac{60-30}{60.4-30} \quad 347 = 342 \ \text{Tons/year}$$

$$\text{Rutland} \quad PE = \frac{60-30}{60.4-30} \quad 1489 = 671 \ \text{Tons/year}$$

Sulfur dioxide concentrations measured at Barre and Burlington were satisfactory on an annual basis but not satisfactory so far as State standards for 24-hour maximum concentrations were concerned.

Air quality levels for SO_2 are acceptable in Vermont on an annual basis at the present time but are close to the secondary standards of 60 micrograms per cubic meter. At Burlington annual levels were 51 micrograms per cubic meter, while at Barre a level of 55 micrograms per cubic meter was measured. The anticipated growth in the state will push these areas past the standard in the near future. Maximum 24-hour values at Barre exceed the standard. The permissible emissions in the Barre area are:

$$PE = \frac{260}{312}\,(1.65) = 1.37 \ \text{Tons/day in January}$$

$$\text{or } 236 \ \text{Tons/year}$$

where 1.65 is the number of tons per day of SO_2 emitted in January obtained from 285 ton/year/365 days x 2.11 degree day excess in January or February average degree days for the year.

Nitrogen dioxide, carbon monoxide and hydrocarbons are related strongly to automotive emissions. Vermont regulations for nitrogen dioxide emissions from stationary sources were used with federal regulations for automotive emissions. Air quality changes are estimated from

$$AQ_1 = AQ_o \left[\frac{E_1}{E_o} F_o + (1-F_o)GF \right] \qquad (3)$$

where subscripts o and 1 represent the base year (1970) and the future year of interest (1975) respectively,

AQ = air quality measured in the region

E = normalized emissions from Appendix I, EPA Rules and Regulations, Title 42, Chapter IV Part 420.

F = ratio of motor vehicle emissions to total emissions in the region and

GF = growth factor for emission increases of stationary sources.

Normalized emissions were determined to be 0.62 for hydrocarbons, 0.73 for carbon monoxide and 0.93 for nitrogen dioxide. Calculations from eq. (3) are shown below.

Carbon monoxide based on 8-hour maximum

Burlington $AQ_1 = 10.3\ [.73 \times .93 + .07 \times 1.3] = 7.93$ mg/m^3

Barre $AQ_1 = 9.2\ [.73 \times .91 + .09 \times 1.3] = 7.19$ mg/m^3

Nitrogen dioxide based on annual mean

Burlington $AQ_1 = 25.0\ [.93 \times .75 + .25 \times 1.3] = 25.6$ mg/m^3

Barre $AQ_1 = 17.2\ [.93 \times .56 + .44 \times 1.3] = 18.8$ mg/m^3

Hydrocarbons based on one-hour maximum

Burlington $AQ_1 = 5.9\ [.62 \times .59 + .41 \times 1.3] = 5.30\ \text{mg/m}^3$

Barre $AQ_1 = 12.5\ [.62 \times .33 + .67 \times 1.2] = 12.6\ \text{mg/m3}$

Existing air quality and future air quality through 1975 should be acceptable if Federal automotive emissions standards are met and maintained.

4.2.6 Control Strategy Selection

4.2.6.1 Particulate and Sulfur Dioxide Emissions

The following tables show the present emissions of particulates and sulfur dioxide reduced to comply with existing Vermont regulations and those emissions expected in 1975 obtained by applying the growth factors listed in the next section. Existing regulations are sufficient to ensure acceptable air quality and permit community growth in the State.

The sudden increase in emissions for Addison County in 1975 for electric generating plants is created by the proposed new plant to be built there. The best available control technology is to be used in this generating station and air quality is not expected to be degraded. Local monitoring will be performed.

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TABLE 4.17 ASSESSMENT OF REGULATIONS
PARTICULATE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 159
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

	Counties									
	Chittenden		Addison		Franklin		Grand Isle		Rutland	
Source Category	1970	1975	1970	1975	1970	1975	1970	1975	1970	1975
I. Fuel Combustion - stationary sources										
A. Residential Fuel:										
1. Bituminous Coal:										
a. Area Sources	8	6	4	3	6	4	0	0	8	6
b. Point Sources										
2. Distillate Oil:										
a. Area Sources	236	271	47	55	62	73	9	10	117	136
b. Point Sources										
3. Residual Oil:										
a. Area Sources	0	0	0	0	0	0	0	0	0	0
b. Point Sources										
4. Natural Gas:										
a. Area Sources	3	3	2	2	0	0	0	0	5	6
b. Point Sources										
5. Wood:										
a. Area Sources	103	105	156	159	225	230	36	37	149	152
b. Point Sources										
6. Total	350	385	209	219	293	307	45	47	279	300
B. Commercial and Institutional Fuel:										
1. Bituminous Coal:										
a. Area Sources	2	1	1	0	1	0	1	0	2	1
b. Point Sources	1	0	2	1	0	0	0	0	0	0
2. Distillate Oil:										
a. Area Sources	55	75	17	23	25	34	4	5	47	64
b. Point Sources	7	10	1	1	0	0	0	0	0	0
3. Residual Oil:										
a. Area Sources	3	12	1	3	2	6	0	1	2	9
b. Point Sources	0	0	10	13	3	4	0	0	8	11
4. Natural Gas:										
a. Area Sources	3	3	0	0	0	1	0	0	0	0
b. Point Sources	0	0	0	0	8	9	0	0	0	0
5. Total	71	101	31	41	39	50	5	6	59	85

TABLE 4.17 (Continued)
PARTICULATE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 159
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

	Counties									
	Chittenden		Addison		Franklin		Grand-Isle		Rutland	
Source Category	1970	1975	1970	1975	1970	1975	1970	1975	1970	1975
C. Industrial Fuel:										
1. Bituminous Coal:										
a. Area Sources	3	1	1	0	2	1	0	0	4	1
b. Point Sources	6	2	1	0	0	0	0	0	0	0
2. Distillate Oil:										
a. Area Sources	7	9	1	1	1	1	0	0	1	1
b. Point Sources	6	8	1	1	0	0	0	0	1	1
3. Residual Oil:										
a. Area Sources	10	12	4	5	4	5	0	0	12	16
b. Point Sources	48	61	2	3	19	24	1	1	59	73
4. Natural Gas:										
a. Area Sources	0	0	0	0	0	0	0	0	0	0
b. Point Sources	3	3	0	0	0	0	0	0	0	0
5. Total	83	96	10	10	22	31	1	1	77	92
D. Steam-electric Power Plant Fuel (point sources only):										
1. Anthracite Coal										
2. Bituminous Coal	81	41	0	0	0	0	0	0	0	0
3. Coke										
4. Distillate Oil	17	17	7	271	4	4	0	0	34	34
5. Residual Oil	19	19	0	0	0	0	0	0	0	0
6. Natural Gas	0	5	0	0	0	0	0	0	0	0
7. Total	117	82	7	271	4	4	0	0	34	34
E. Total Stationary Fuel Combustion	621	664	257	341	358	392	51	54	449	511
II. Process Losses:										
A. Area Sources										
B. Point Sources										
1. Chemical Process Industries	0	0	15	18	68	81	0	0	0	0
2. Food & Agricultural Industries										
3. Metallurgical Industries	0	0	0	0	0	0	0	0	3	4
4. Mineral Products Industries	42	50	33	39	44	52	0	0	56	66
5. Petroleum Refining & Petrochemical Operations	42	50	44	52	22	26	0	0	75	89
6. Wood Processing	15	16	33	35	0	0	0	0	71	76
7. Petroleum Storage										
C. Total Process Losses	99	116	110	126	66	78	0	0	205	235

TABLE 4.17 (Continued)
PARTICULATE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 159
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

Source Category	Counties									
	Chittenden		Addison		Franklin		Grand Isle		Rutland	
	1970	1975	1970	1975	1970	1975	1970	1975	1970	1975
III. Solid Waste Disposal:										
A. Incineration:										
1. On-site:										
a. Area Sources	10	11	2	2	3	3	0	0	5	6
b. Point Sources										
2. Municipal, etc.:										
a. Area Sources	0	0	0	0	0	0	0	0	0	0
b. Point Sources										
B. Open Burning:										
1. On-site:										
a. Area Sources	71	7	18	2	33	3	4	0	38	4
b. Point Sources	0	0	0	0	0	0	0	0	0	0
C. Total Solid Waste Disposal	81	18	20	4	36	6	4	0	43	10
IV. Transportation (area sources only):										
A. Motor Vehicles										
1. Gasoline Powered	73	92	33	41	29	36	10	13	69	87
2. Diesel Powered	11	14	2	3	4	5	0	0	14	18
B. Off-highway Fuel Usage	0	0	0	0	0	0	0	0	0	0
C. Aircraft	294	400	0	0	0	0	0	0	0	0
D. Railroads	9	10	2	2	4	5	0	0	4	5
E. Vessels	4	5	0	0	0	0	0	0	0	0
F. Gasoline Handling Evaporative Losses										
G. Other (specify)										
H. Total Transportation	391	521	37	46	37	46	10	13	87	110
V. Grand Totals										
A. Area Sources	905	1025	291	301	401	407	64	66	477	512
B. Point Sources	287	279	134	416	100	119	1	1	307	354
C. Total	1192	1304	425	717	501	526	65	67	784	866

TABLE 4.18 ASSESSMENT OF REGULATIONS
PARTICULATE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 221
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

	Counties									
	Bennington		Caledonia		Essex		Lamoille		Orange	
Source Category	1970	1975	1970	1975	1970	1975	1970	1975	1970	1975
I. Fuel Combustion - stationary sources										
A. Residential Fuel:										
1. Bituminous Coal:										
a. Area Sources	7	5	7	5	2	1	3	2	4	3
b. Point Sources										
2. Distillate Oil:										
a. Area Sources	78	92	49	58	11	14	30	36	44	52
b. Point Sources										
3. Residual Oil:										
a. Area Sources										
b. Point Sources										
4. Natural Gas:										
a. Area Sources	1	1	1	1	1	1	0	0	0	0
b. Point Sources										
5. Wood:										
a. Area Sources	111	113	288	294	54	55	200	204	322	328
b. Point Sources										
6. Total	197	211	345	358	68	71	233	242	370	383
B. Commercial and Institutional Fuel:										
1. Bituminous Coal:										
a. Area Sources	2	0	1	0	0	0	0	0	0	0
b. Point Sources	0	0	0	0	0	0	0	0	0	0
2. Distillate Oil:										
a. Area Sources	29	40	22	30	4	5	14	19	15	20
b. Point Sources	0	0	0	0	0	0	0	0	0	0
3. Residual Oil:										
a. Area Sources	3	5	2	3	0	0	2	3	2	3
b. Point Sources	17	23	6	8	0	0	2	3	2	3
4. Natural Gas:										
a. Area Sources	0	0	0	0	0	0	0	0	0	0
b. Point Sources	0	0	0	0	0	0	0	0	0	0
5. Total	51	68	31	33	4	5	18	25	19	26

TABLE 4.18 (Continued)
PARTICULATE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 221
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

Source Category	Counties									
	Orleans		Washington		Windham		Windsor			
	1970	1975	1970	1975	1970	1975	1970	1975		
I. Fuel Combustion - stationary sources										
A. Residential Fuel:										
1. Bituminous Coal:										
a. Area Sources	8	6	19	13	12	8	16	11		
b. Point Sources										
2. Distillate Oil:										
a. Area Sources	41	49	121	144	63	72	102	122		
b. Point Sources										
3. Residual Oil:										
a. Area Sources										
b. Point Sources										
4. Natural Gas:										
a. Area Sources	0	0	1	1	0	0	0	1		
b. Point Sources										
5. Wood:										
a. Area Sources	249	254	337	345	201	205	388	397		
b. Point Sources										
6. Total	298	309	478	503	276	285	506	531		
B. Commercial and Institutional Fuel:										
1. Bituminous Coal:										
a. Area Sources	1	0	1	0	1	1	2	2		
b. Point Sources	0	0	1	0	0	0	0	0		
2. Distillate Oil:										
a. Area Sources	19	26	57	77	12	16	40	54		
b. Point Sources										
3. Residual Oil:										
a. Area Sources	2	3	8	11	2	3	4	6		
b. Point Sources	0	0	31	41	21	28	3	4		
4. Natural Gas:										
a. Area Sources	0	0	0	0	0	0	0	0		
b. Point Sources	0	0	0	0	0	0	0	0		
5. Total	22	29	97	129	35	48	49	66		

TABLE 4.18 (Continued)
PARTICULATE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 221
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

	Counties									
	Bennington		Caledonia		Essex		Lamoille		Orange	
Source Category	1970	1975	1970	1975	1970	1975	1970	1975	1970	1975
C. Industrial Fuel:										
1. Bituminous Coal:										
a. Area Sources	3	1	3	1	0	0	2	1	2	1
b. Point Sources	4	1	0	0	0	0	0	0	0	0
2. Distillate Oil:										
a. Area Sources	0	0	0	0	0	0	0	0	0	0
b. Point Sources	0	0	3	4	0	0	0	0	0	0
3. Residual Oil:										
a. Area Sources	5	6	5	6	3	4	2	2	4	5
b. Point Sources	17	21	4	5	9	11	8	10	0	0
4. Natural Gas:										
a. Area Sources	0	0	0	0	0	0	0	0	0	0
b. Point Sources	0	0	0	0	0	0	0	0	0	0
5. Total	29	29	15	16	12	15	12	13	6	6
D. Steam-electric Power Plant Fuel (point sources only):										
1. Anthracite Coal										
2. Bituminous Coal										
3. Coke										
4. Distillate Oil										
5. Residual Oil										
6. Natural Gas										
7. Total										
E. Total Stationary Fuel Combustion	277	308	391	407	84	91	263	280	395	415
II. Process Losses:										
A. Area Sources										
B. Point Sources										
1. Chemical Process Industries	1	1	0	0	0	0	0	0	0	0
2. Food & Agricultural Industries	0	0	29	32	0	0	0	0	0	0
3. Metallurgical Industries	0	0	6	8	0	0	0	0	0	0
4. Mineral Products Industries	0	0	0	0	0	0	51	57	0	0
5. Petroleum Refining & Petrochemical Operations	12	14	38	45	21	25	22	25	0	0
6. Wood Processing	60	64	54	58	540	577	24	26	55	59
7. Petroleum Storage										
C. Total Process Losses	73	79	127	143	561	602	97	108	55	59

TABLE 4.18 (Continued)
PARTICULATE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 221
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

	Counties							
	Orleans		Washington		Windham		Windsor	
Source Category	1970	1975	1970	1975	1970	1975	1970	1975
C. Industrial Fuel:								
1. Bituminous Coal:								
a. Area Sources	2	1	9	3	3	1	5	2
b. Point Sources	0	0	0	0	0	0	0	0
2. Distillate Oil:								
a. Area Sources	0	0	0	0	10	12	0	1
b. Point Sources	0	0	0	0	0	0	4	5
3. Residual Oil:								
a. Area Sources	3	4	10	13	10	13	12	16
b. Point Sources	17	21	1	1	0	0	6	7
4. Natural Gas:								
a. Area Sources	0	0	0	0	0	0	0	0
b. Point Sources	0	0	0	0	0	0	0	0
5. Total	22	25	20	17	23	26	27	31
D. Steam-electric Power Plant Fuel (point sources only):								
1. Anthracite Coal								
2. Bituminous Coal								
3. Coke								
4. Distillate Oil	0	0	0	0	0	0	35	35
5. Residual Oil								
6. Natural Gas								
7. Total	0	0	0	0	0	0	35	35
E. Total Stationary Fuel Combustion	342	363	595	649	334	359	582	628
II. Process Losses:								
A. Area Sources								
B. Point Sources								
1. Chemical Process Industries								
2. Food & Agricultural Industries								
3. Metallurgical Industries	0	0	2	3	0	0	2	3
4. Mineral Products Industries	102	114	2	2	0	0	19	23
5. Petroleum Refining & Petrochemical Operations	22	25	6	7	0	0	0	0
6. Wood Processing	175	187	8	9	35	37	350	374
7. Petroleum Storage								
C. Total Process Losses	299	326	18	21	35	37	371	400

TABLE 4.18 (Continued)
PARTICULATE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 221
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

Source Category	Counties									
	Bennington		Caledonia		Essex		Lamoille		Orange	
	1970	1975	1970	1975	1970	1975	1970	1975	1970	1975
III. Solid Waste Disposal:										
A. Incineration:										
1. On-site:										
a. Area Sources	3	3	2	2	1	1	1	1	2	2
b. Point Sources										
2. Municipal, etc.:										
a. Area Sources										
b. Point Sources										
B. Open Burning:										
1. On-site:										
a. Area Sources	21	2	16	2	4	0	10	1	13	1
b. Point Sources										
C. Total Solid Waste Disposal	24	5	18	4	5	1	11	2	15	3
V. Transportation (area sources only):										
A. Motor Vehicles										
1. Gasoline Powered	39	49	28	35	7	9	17	21	24	30
2. Diesel Powered	3	4	2	3	0	0	1	1	2	3
B. Off-highway Fuel Usage										
C. Aircraft										
D. Railroads	1	1	2	2	1	1	1	1	1	1
E. Vessels										
F. Gasoline Handling Evaporative Losses										
G. Other (specify)										
H. Total Transportation	43	54	32	40	8	10	19	23	27	34
V. Grand Totals										
A. Area Sources	306	322	428	412	88	91	283	292	435	415
B. Point Sources	111	124	140	160	570	613	108	121	57	62
C. Total	417	446	568	572	658	704	391	413	492	477

TABLE 4.18 (Continued)
PARTICULATE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 221
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

	Counties									
	Orleans		Washington		Windham		Windsor			
Source Category	1970	1975	1970	1975	1970	1975	1970	1975		
II. Solid Waste Disposal:										
A. Incineration:										
1. On-site:										
a. Area Sources	2	2	5	6	3	3	4	5		
b. Point Sources										
2. Municipal, etc.:										
a. Area Sources										
b. Point Sources										
B. Open Burning:										
1. On-site:										
a. Area Sources	14	1	34	3	24	2	32	3		
b. Point Sources										
C. Total Solid Waste Disposal	16	3	39	9	27	5	36	8		
V. Transportation (area sources only):										
A. Motor Vehicles										
1. Gasoline Powered	30	38	48	60	47	59	9	11		
2. Diesel Powered	1	1	31	39	13	16	1	1		
B. Off-highway Fuel Usage										
C. Aircraft										
D. Railroads	1	1	1	1	2	2	2	2		
E. Vessels										
F. Gasoline Handling Evaporative Losses										
G. Other (specify)										
H. Total Transportation	32	40	80	100	62	77	12	14		
V. Grand Totals										
A. Area Sources	373	386	682	716	403	413	621	632		
B. Point Sources	316	347	51	63	56	65	380	418		
C. Total	689	733	733	779	459	478	1001	1050		

Table 4.19 ASSESSMENT OF REGULATIONS

SULFUR DIOXIDE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 159
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

Source Category	Counties									
	Chittenden		Addison		Franklin		Grand Isle		Rutland	
	1970	1975	1970	1975	1970	1975	1970	1975	1970	1975
I. Fuel Combustion - stationary sources										
A. Residential Fuel:										
1. Bituminous Coal:	12	8	6	4	8	6	1	1	9	6
a. Area Sources										
b. Point Sources										
2. Distillate Oil:										
a. Area Sources	236	270	205	236	266	304	37	42	509	585
b. Point Sources										
3. Residual Oil:										
a. Area Sources	0	0	0	0	0	0	0	0	0	0
b. Point Sources										
4. Natural Gas:										
a. Area Sources	0	0	0	0	0	0	0	0	0	0
b. Point Sources										
5. Wood:										
a. Area Sources	7	7	9	9	13	13	2	2	8	8
b. Point Sources										
6. Total	248	277	220	249	287	323	40	45	526	599
B. Commercial and Institutional Fuel:										
1. Bituminous Coal:										
a. Area Sources	1	0	1	0	2	1	0	0	3	2
b. Point Sources	0	0	4	1	0	0	0	0	0	0
2. Distillate Oil:										
a. Area Sources	175	235	48	64	73	98	12	16	138	185
b. Point Sources	24	32	2	3	0	0	0	0	0	0
3. Residual Oil:										
a. Area Sources	30	40	8	11	14	19	2	3	23	32
b. Point Sources	236	316	95	127	81	107	0	0	100	134
4. Natural Gas:										
a. Area Sources	0	0	0	0	0	0	0	0	0	0
b. Point Sources	0	0	0	0	0	0	0	0	0	0
5. Total	466	623	158	206	170	225	14	19	264	353

Table 4.19 (Continued)

SULFUR DIOXIDE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 159
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

	Counties									
	Chittenden		Addison		Franklin		Grand Isle		Rutland	
Source Category	1970	1975	1970	1975	1970	1975	1970	1975	1970	1975
C. Industrial Fuel:										
1. Bituminous Coal:										
a. Area Sources	3	1	1	0	1	0	0	0	3	1
b. Point Sources	0	0	12	0	0	0	0	0	0	0
2. Distillate Oil:										
a. Area Sources	6	7	2	2	2	2	0	0	6	7
b. Point Sources	12	15	3	4	0	0	0	0	5	6
3. Residual Oil:										
a. Area Sources	77	93	31	38	31	37	0	0	92	110
b. Point Sources	144	171	80	95	78	97	6	7	372	442
4. Natural Gas:										
a. Area Sources	0	0	0	0	0	0	0	0	0	0
b. Point Sources	0	0	0	0	0	0	0	0	0	0
5. Total	242	287	129	139	112	136	6	7	478	566
D. Steam-electric Power Plant Fuel (point sources only):										
1. Anthracite Coal										
2. Bituminous Coal	1251	625	0	0	0	0	0	0	0	0
3. Coke										
4. Distillate Oil	89	89	7	1440	8	8	0	0	69	69
5. Residual Oil	70	70	0	6	0	0	0	0	0	0
6. Natural Gas	0	60	0	0	0	0	0	0	0	0
7. Total	1267	784	7	1446	8	8	0	0	69	69
E. Total Stationary Fuel Combustion	2223	1971	514	2040	577	692	60	54	1337	1587
II. Process Losses:										
A. Area Sources										
B. Point Sources										
1. Chemical Process Industries										
2. Food & Agricultural Industries										
3. Metallurgical Industries										
4. Mineral Products Industries										
5. Petroleum Refining & Petrochemical Operations	29	34	25	30	1	1	0	0	2	2
6. Wood Processing	2	2	3	3	0	0	0	0	3	3
7. Petroleum Storage										
C. Total Process Losses	31	36	28	33	1	1	0	0	5	5

Table 4.19 (Continued)

SULFUR DIOXIDE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 159
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

	Counties									
	Chittenden		Addison		Franklin		Grand Isle		Rutland	
Source Category	1970	1975	1970	1975	1970	1975	1970	1975	1970	1975
II. Solid Waste Disposal:										
A. Incineration:										
1. On-site:										
a. Area Sources	2	2	1	1	1	1	0	1	1	1
b. Point Sources										
2. Municipal, etc.:										
a. Area Sources	0	0	0	0	0	0	0	0	0	0
b. Point Sources										
B. Open Burning:										
1. On-site:										
a. Area Sources	4	0	1	0	1	0	0	0	3	0
b. Point Sources										
C. Total Solid Waste Disposal	6	2	2	1	2	1	0	1	4	1
V. Transportation (area sources only):										
A. Motor Vehicles										
1. Gasoline Powered	89	112	39	49	35	44	10	13	80	100
2. Diesel Powered	38	48	1	1	1	1	0	0	25	31
B. Off-highway Fuel Usage										
C. Aircraft	49	67	0	0	0	0	0	0	0	0
D. Railroads	23	27	4	5	10	12	0	0	12	14
E. Vessels	11	14	0	0	0	0	0	0	0	0
F. Gasoline Handling Evaporative Losses										
G. Other (specify)										
H. Total Transportation	210	268	44	55	46	57	10	13	117	145
V. Grand Totals										
A. Area Sources	793	923	357	420	458	538	64	78	912	1082
B. Point Sources	1714	1354	231	1709	158	213	6	7	551	656
C. Total	2507	2277	588	2129	616	751	70	85	1463	1738

TABLE 4.20 ASSESSMENT OF REGULATIONS
SULFUR OXIDE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 221
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

	Counties									
	Bennington		Caledonia		Essex		Lamoille		Orange	
Source Category	1970	1975	1970	1975	1970	1975	1970	1975	1970	1975
I. Fuel Combustion - stationary sources										
A. Residential Fuel:										
1. Bituminous Coal:										
a. Area Sources	12	8	12	8	4	3	5	4	6	4
b. Point Sources										
2. Distillate Oil:										
a. Area Sources	337	391	212	247	49	57	129	149	191	222
b. Point Sources										
3. Residual Oil:										
a. Area Sources										
b. Point Sources										
4. Natural Gas:										
a. Area Sources										
b. Point Sources										
5. Wood:										
a. Area Sources	6	9	16	19	3	3	11	11	18	18
b. Point Sources										
6. Total	355	409	240	274	56	63	145	164	215	244
B. Commercial and Institutional Fuel:										
1. Bituminous Coal:										
a. Area Sources	0	0	3	1	1	0	2	1	2	1
b. Point Sources										
2. Distillate Oil:										
a. Area Sources	40	54	63	87	11	15	40	55	43	60
b. Point Sources	0	0	3	4	0	0	0	0	0	0
3. Residual Oil:										
a. Area Sources	23	31	17	24	3	5	11	16	12	17
b. Point Sources	81	106	46	46	5	7	0	0	14	18
4. Natural Gas:										
a. Area Sources										
b. Point Sources										
5. Total	144	191	132	162	20	27	53	72	71	96

TABLE 4.20 (Continued)
SULFUR OXIDE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 221
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

Source Category	Counties									
	Orleans		Washington		Windham		Windsor			
	1970	1975	1970	1975	1970	1975	1970	1975		
I. Fuel Combustion - stationary sources										
A. Residential Fuel:										
1. Bituminous Coal:										
a. Area Sources	14	10	28	20	17	12	23	16		
b. Point Sources										
2. Distillate Oil:										
a. Area Sources	178	222	528	649	270	316	440	542		
b. Point Sources										
3. Residual Oil:										
a. Area Sources										
b. Point Sources										
4. Natural Gas:										
a. Area Sources										
b. Point Sources										
5. Wood:										
a. Area Sources	14	14	19	20	12	13	22	23		
b. Point Sources										
6. Total	206	246	575	689	299	241	485	581		
B. Commercial and Institutional Fuel:										
1. Bituminous Coal:										
a. Area Sources	3	1	4	2	2	1	2	1		
b. Point Sources	0	0	0	0	0	0	1	0		
2. Distillate Oil:										
a. Area Sources	54	75	159	221	65	90	115	159		
b. Point Sources	0	0	1	1	1	1	1	0		
3. Residual Oil:										
a. Area Sources	15	21	42	58	18	25	31	43		
b. Point Sources	10	13	190	255	146	196	17	23		
4. Natural Gas:										
a. Area Sources										
b. Point Sources										
5. Total	82	110	396	547	232	313	167	226		

TABLE 4.20 (Continued)
SULFUR OXIDE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 221
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

	Counties									
	Bennington		Caledonia		Essex		Lamoille		Orange	
Source Category	1970	1975	1970	1975	1970	1975	1970	1975	1970	1975
C. Industrial Fuel:										
1. Bituminous Coal:										
a. Area Sources	3	1	2	1	0	0	1	0	1	0
b. Point Sources	1	0	0	0	0	0	0	0	0	0
2. Distillate Oil:										
a. Area Sources	45	56	1	1	0	0	0	0	0	0
b. Point Sources	0	0	8	10	1	1	0	0	0	0
3. Residual Oil:										
a. Area Sources	35	43	16	20	15	18	10	12	31	37
b. Point Sources	123	147	22	26	59	70	72	86	3	4
4. Natural Gas:										
a. Area Sources										
b. Point Sources										
5. Total	207	247	49	58	75	89	83	98	35	41
D. Steam-electric Power Plant Fuel (point sources only):										
1. Anthracite Coal										
2. Bituminous Coal										
3. Coke										
4. Distillate Oil										
5. Residual Oil										
6. Natural Gas										
7. Total										
E. Total Stationary Fuel Combustion	706	847	421	494	151	179	270	334	321	381
II. Process Losses:										
A. Area Sources										
B. Point Sources										
1. Chemical Process Industries										
2. Food & Agricultural Industries										
3. Metallurgical Industries										
4. Mineral Products Industries										
5. Petroleum Refining & Petrochemical Operations	0	0	1	1	1	1	1	1	0	0
6. Wood Processing	7	7	5	5	378	404	2	2	6	6
7. Petroleum Storage										
C. Total Process Losses	7	7	6	6	379	405	3	3	6	6

Table 4.20 (Continued)

SULFUR OXIDES EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 221
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

	Counties									
	Orleans		Washington		Windham		Windsor			
Source Category	1970	1975	1970	1975	1970	1975	1970	1975		
C. Industrial Fuel:										
1. Bituminous Coal:										
a. Area Sources	2	1	3	2	4	1	3	2		
b. Point Sources	0	0	0	0	0	0	20	6		
2. Distillate Oil:										
a. Area Sources	0	1	2	3	4	2	1	3		
b. Point Sources	0	0	0	0	0	0	16	24		
3. Residual Oil:										
a. Area Sources	20	25	87	104	87	104	76	91		
b. Point Sources	24	29	8	10	0	0	35	42		
4. Natural Gas:										
a. Area Sources										
b. Point Sources										
5. Total	46	56	100	119	95	107	151	168		
D. Steam-electric Power Plant Fuel (point sources only):										
1. Anthracite Coal										
2. Bituminous Coal										
3. Coke										
4. Distillate Oil	0	0	0	0	0	0	33	33		
5. Residual Oil										
6. Natural Gas										
7. Total	0	0	0	0	0	0	33	33		
E. Total Stationary Fuel Combustion	334	412	1071	1355	626	661	836	1008		
II. Process Losses:										
A. Area Sources										
B. Point Sources										
1. Chemical Process Industries										
2. Food & Agricultural Industries										
3. Metallurgical Industries										
4. Mineral Products Industries										
5. Petroleum Refining & Petrochemical Operations	1	1	0	0	0	0	0	0		
6. Wood Processing	23	25	1	1	4	4	57	61		
7. Petroleum Storage										
C. Total Process Losses	24	26	1	1	4	4	57	61		

TABLE 4.20 (Continued)
SULFUR OXIDE EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 221
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

	Counties									
	Bennington		Caledonia		Essex		Lamoille		Orange	
Source Category	1970	1975	1970	1975	1970	1975	1970	1975	1970	1975
III. Solid Waste Disposal:										
A. Incineration:										
1. On-site:										
a. Area Sources	1	7	1	6	0	1	0	3	0	5
b. Point Sources										
2. Municipal, etc.:										
a. Area Sources										
b. Point Sources										
B. Open Burning:										
1. On-site:										
a. Area Sources	1	0	1	0	0	0	1	0	1	0
b. Point Sources										
C. Total Solid Waste Disposal	2	7	2	6	0	1	1	3	1	5
IV. Transportation (area sources only):										
A. Motor Vehicles										
1. Gasoline Powered	44	59	32	40	9	11	19	24	29	36
2. Diesel Powered	6	8	4	5	0	0	3	4	4	5
B. Off-highway Fuel Usage										
C. Aircraft										
D. Railroads	4	5	4	5	3	3	4	5	3	3
E. Vessels										
F. Gasoline Handling Evaporative Losses										
G. Other (specify)										
H. Total Transportation	54	72	40	50	12	14	26	33	36	44
V. Grand Totals										
A. Area Sources	557	673	384	464	98	116	236	284	341	408
B. Point Sources	212	260	85	92	384	483	75	89	23	28
C. Total	769	933	369	556	482	599	311	373	364	436

Table 4.20 (Continued)

SULFUR OXIDES EMISSIONS SUMMARY, TONS/YEAR
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 221
VERMONT STRATEGY APPLIED TO 1970 EMISSIONS, DATA PROJECTED TO 1975

Source Category	Counties									
	Orleans		Washington		Windham		Windsor			
	1970	1975	1970	1975	1970	1975	1970	1975		
I. Solid Waste Disposal:										
A. Incineration:										
1. On-site:										
a. Area Sources	4	5	1	13	1	8	1	10		
b. Point Sources										
2. Municipal, etc.:										
a. Area Sources										
b. Point Sources										
B. Open Burning:										
1. On-site:										
a. Area Sources	1	0	2	0	1	0	2	0		
b. Point Sources										
C. Total Solid Waste Disposal	1	5	3	13	2	8	3	10		
I. Transportation (area sources only):										
A. Motor Vehicles										
1. Gasoline Powered	19	24	56	70	58	73	11	14		
2. Diesel Powered	2	3	56	70	29	36	1	1		
B. Off-highway Fuel Usage										
C. Aircraft										
D. Railroads	2	2	5	6	6	7	5	6		
E. Vessels										
F. Gasoline Handling Evaporative Losses										
G. Other (specify)										
H. Total Transportation	23	29	117	146	93	116	17	21		
V. Grand Totals										
A. Area Sources	324	404	992	1238	574	588	733	911		
B. Point Sources	58	68	200	267	151	201	180	189		
C. Total	382	474	1192	1505	725	789	913	1100		

4.2.6.2 Growth Factors

The growth factors presented in Table 4.22 were obtained from the Department of Commerce Economic Projection* for Vermont. Population increases were obtained from the same publication and modified by information received from local planning agencies. Growth factors for Vermont for various activities are shown in Table 4.21 from the U. S. Department of Commerce Economic Projection for Vermont.

The projection procedure used by the Department of Commerce called first for projections of summary national totals, which were then disaggregated into national industry components. The national industry components, in turn, were disaggregated to the AQCR's.

Conceivably, the economy of each AQCR could have been projected independently. However, the alternate course of first making national projections as a guide or control on the AQCR projections was followed for several reasons.

National trends as well as national inter-industry relationships are generally more stable and measurable, and hence, projected more reliably than are those of smaller areas. This is another way of saying that national measurements can be made more accurately than can regional ones. It is well to utilize the more accurate available data and stable relationships first as this places them in control positions.

The same reasoning applies within the set of national projections. Conceivably, each industry could have been projected separately and all summed to the national aggregates of employment, output, income, and earnings. Instead, a set of aggregate measures was first developed. These were then disaggregated into national totals for the individual industries.

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* U. S. Department of Commerce, 1968: Economic Projections for Air Quality Control Regions, Government Printing Office, Washington, D. C.

The initial step in preparing economic projections for the AQCR's was to project the GNP to 1970, 1975 and 1980. GNP was projected as the product of projected annual employment, man-hours worked per year, and product per man hour.

National employment totals were derived from the Census Bureau's published projections of the population by applying to them estimated labor force participation ratios and unemployment rates derived from analyses of past trends in these variables. Hours worked per year and product per man hour were also projected on the basis of analyses of the trends in these two variables since 1948.

Total GNP was disaggregated into the gross product originating (GPO) in each of 37 industries on a national basis. This disaggregation represented an extension of trends in the industrial composition of the economy over the past two decades. National totals of aggregate personal income and earnings of persons engaged in each industry, and employment by industry were derived from the GNP and GPO projections on the basis of past relationships and from separate analyses of the industrial composition of earnings and employment.

The shares of earnings and employment in each basic industry (industries the production of which is exported to other areas) received by residents of each of the 173 economic areas of the Nation were calculated for 8 selected years from 1929 to 1967. Changes in the shares accruing to each region were analyzed industry-by-industry. Mathematical extensions of these trends were calculated and then modified in accordance with the finding of special industry analyses and in light of natural resource availability. Projected shares of earnings and employment in 1970, 1975 and 1980 in each region were applied to the national totals in the appropriate industry to obtain projected earnings in dollar terms and employment in numbers of persons.

Earnings and employment in nonbasic or residentiary industries (industries which serve local businesses and population) were then allocated to the 173 regions in accordance with projections of the trend in past relationships of basic and residentiary industries.

The other income shares were allocated to the regions in accordance with past trends. Population was projected on the basis of projected employment and income.

Finally, the portion of the various employment and income components accruing to AQCR's were broken out of the projections for economic areas in accordance with trends measured from 1929 to 1967.

Throughout the projection procedure special attention was paid to obtaining the proper interindustry relations at the national, regional, and AQCR levels and to insuring that the geographic measures all fitted within the projected national economy.

Growth factors shown in Table 4.22 are based on those listed in Table 4.21 from the Department of Commerce Economic Projection with some modification for changes in fuel use. Significant conversion of fuel from coal to oil is anticipated in Vermont in line with historical trends from 1960 to 1970 as well as new regulations for fuel. An estimate was made that coal use in residences would be down by 30 percent and coal use by commercial or industrial plants would be down by 70 percent in 1975. Division of the heating requirements to replace the decreased coal use was made on the basis of existing use of fuel in each region. The factors were based on

Table 4.21 U. S. Department of Commerce Economic Growth Projections for Vermont from 1970 to 1975

Category of activity	1970-1975 increase factor
Agriculture, Forestry, Fisheries	1.00
Mining and Quarrying	1.418
Construction	1.254
Food Processing	1.172
Fabric Processing	1.050
Lumber and Furniture	1.069
Paper Manufacturing	1.373
Printing and Publishing	1.201
Chemical Industry	1.170
Stone, Clay, Glass and Concrete Products	1.186
Primary Metal Industries	1.241
Metal Fabrication	1.298
Machinery, except Electrical	1.458
Electrical Machinery	1.278
Transportation Equipment	1.165
Miscellaneous Manufacturing	1.303
Railroad Transportation	1.160
Highway Transportation	1.256
Motor Freight	1.294
Water Transportation	1.265
Air Transportation	1.360
Pipe Lines	1.257
Transportation Services	1.257
Communications	1.283
Electric, Gas, and Sanitary Services	1.304
Wholesale Trade	1.283
Retail Trade	1.283
Finance, Insurance and Real Estate	1.283
Local Services	1.343
Government	1.307
Population	1.145

TABLE 4.22

GROWTH FACTORS PARTICULATES AND SO_2

DATA REPRESENTATIVE OF CALENDAR YEAR 1970-1975

Source Category	Region 159	Region 221
1. Fuel Combustion-stationary sources		
A. Residential Fuel:		
1. Bituminous Coal:		
a. Area Sources		
b. Point Sources	0.7	0.7
2. Distillate Oil:		
a. Area Sources	1.14 + 0.96 coal conv.	1.15 + 0.90 coal conv.
b. Point Sources		
3. Residual Oil		
a. Area Sources		
b. Point Sources	none	none
4. Natural Gas:		
a. Area Sources		
b. Point Sources	1.14	1.15
5. Wood:		
a. Area Sources	1.02 + 0.04 coal conv.	1.02 + 0.10 coal conv.
b. Point Sources		
B. Commercial and Institutional Fuel:		
1. Bituminous Coal:		
a. Area Sources	0.3	0.3
b. Point Sources	0.3	0.3
2. Distillate Oil:		
a. Area Sources	1.356 + 0.36 coal conv.	1.343 + 0.36 coal conv.
b. Point Sources		
3. Residual Oil:		
a. Area Sources	1.327 + 0.64 coal conv.	1.341 + 0.64 coal conv.
b. Point Sources		
4. Natural Gas:		
a. Area Sources	1.110	1.110
b. Point Sources		

(cont.)

TABLE 4.22

GROWTH FACTORS PARTICULATES AND SO_2
DATA REPRESENTATIVE OF CALENDAR YEAR 1970-1975

Source Category	Region 159	Region 221
C. Industrial Fuel:		
1. Bituminous Coal:		
a. Area Sources		
b. Point Sources	0.3	0.3
2. Distillate Oil:		
a. Area Sources		
b. Point Sources	1.222 + 0.39 coal conv.	1.221 + 0.39 coal conv.
3. Residual Oil:		
a. Area Sources		
b. Point Sources	1.243 + 0.61 coal conv.	1.189 + 0.61 coal conv.
4. Natural Gas:		
a. Area Sources		
b. Point Sources	1.15	1.110
D. Steam-electric Power Plant Fuel (point sources only):		
1. Anthracite Coal	Individual stations entered	Individual stations entered
2. Bituminous Coal		
3. Coke		
4. Distillate Oil		
5. Residual Oil		
6. Natural Gas		
II. Process Losses:		
A. Area Sources	1.14	1.15
B. Point Sources		
1. Chemical Process Industries	1.170	1.170
2. Food & Agricultural Industries	1.086	1.086
3. Metallurgical Industries	1.270	1.270
4. Mineral Products Industries	1.186	1.186
5. Petroleum Refining & Petrochemical Operations	1.180	1.180
6. Wood Processing	1.069	1.069
7. Petroleum Storage	1.257	1.257

(cont.)

TABLE 4.22

GROWTH FACTORS PARTICULATES AND SO_2

DATA REPRESENTATIVE OF CALENDAR YEAR 1970-1975

Source Category	Region 159	Region 221
III Solid Waste Disposal:		
A. Incineration:		
1. On-site		
a. Area Sources		
b. Point Sources	1.140	1.150
2. Municipal, etc:		
a. Area Sources	none	none
b. Point Sources		
B. Open Burning:		
1. On-site:		
a. Area Sources	0.1	0.1
b. Point Sources	0	0
IV Transportation (area sources only):		
A. Motor Vehicles		
1. Gasoline Powered		
2. Diesel Powered	1.256	1.256
B. Off-highway Fuel Usage	1.140	1.150
C. Aircraft	1.360	1.360
D. Railroads	1.160	1.160
E. Vessels	1.265	1.265
F. Gasoline Handling Evaporative Losses	1.257	1.257
G. Other (specify)		

BTU's rather than gallons or tons of fuels.

Residential fuel combustion growth factors were based on population change except for wood. It was anticipated that new homes will not in general employ wood furnaces but it was thought that some coal users would convert to wood as supplies of coal become less available. No change in the ratio of oil and gas use was projected.

Industrial process weights were projected by applying Department of Commerce growth factors to the process weight rate of each industry. The resulting factors were divided by the total weight for each tabular category to yield a resultant weight factor. As an example, metallurgical industries represent values compiled from Primary Metal Industries, Metal Fabrication Machinery, and Transportation Equipment weighted according to existing process weight rates from the 1970 inventory. The same procedure was used to compile growth factors for fuel use except that BTU's of heat used by each classification was used to weight the growth factor rather than a process weight rate. In addition the factors were obtained for further breakdowns by type of fuel now being used. Coal was distributed on the basis of existing fuel use.

Planned electric generating facilities were provided by the Vermont Public Service Company. Emissions were estimated from data for similar existing facilities employing the latest pollution control technology. These emissions were added into the county listings where appropriate. Growth factors were not applied to existing facilities.

4.2.6.3 Carbon Monoxide, Hydrocarbons and Nitrogen Dioxide

The following tables show the emissions of carbon monoxide, hydrocarbons, and nitrogen dioxide expected in 1975 obtained by applying the growth factors listed in the next section. Existing regulations are sufficient to ensure acceptable air quality and permit community growth in the State.

TABLE 4.23

CARBON MONOXIDE EMISSIONS SUMMARY (TONS/YEAR)
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 159
DATA REPRESENTATIVE OF CALENDAR YEAR 1975
REGULATIONS AND GROWTH FACTORS APPLIED TO 1970 INVENTORY

Source Category	Counties Addison	Chittenden	Franklin	Grand Isle	Rutland
I Fuel Combustion - Stationary Sources					
A. Area	58	180	74	11	131
B. Point	123	156	74	0	7
C. Total	171	336	148	11	138
II Process Losses					
A. Area	0	0	0	0	0
B. Point	0	0	0	0	171
C. Total	0	0	0	0	171
III Solid Waste Disposal					
A. Area	1062	4275	1369	157	2305
B. Point	0	0	0	0	0
C. Total	1062	4275	1369	157	2305
IV Transportation Area	9683	28877	8503	2620	24874
V Miscellaneous Area					
VI Grand Totals					
A. Area	10803	33332	9946	2788	27310
B. Point	123	156	74	0	178
C. Total	10926	33488	10010	2788	27488

TABLE 4.24

NITROGEN DIOXIDE EMISSIONS SUMMARY (TONS/YEAR)
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 159
DATA REPRESENTATIVE OF CALENDAR YEAR 1975
REGULATIONS AND GROWTH FACTORS APPLIED TO 1970 INVENTORY

	Counties				
Source Category	Addison	Chittenden	Franklin	Grand Isle	Rutland
I Fuel Combustion - Stationary Sources					
A. Area	242	712	329	46	513
B. Point	246	1224	231	4	422
C. Total	488	1936	560	50	935
II Process Losses					
A. Area	0	0	0	0	0
B. Point	0	0	0	0	0
C. Total	0	0	0	0	0
III Solid Waste Disposal					
A. Area	76	310	98	11	164
B. Point	0	0	0	0	0
C. Total	76	310	98	11	164
IV Transportation Area	1763	4536	1547	478	3675
V Miscellaneous Area					
VI Grand Totals					
A. Area	2801	5558	1974	535	4352
B. Point	246	1224	231	4	422
C. Total	2327	6782	2205	539	4774

TABLE 4.25
HYDROCARBON EMISSIONS SUMMARY (TONS/YEAR)
CHAMPLAIN VALLEY AIR QUALITY CONTROL REGION 159
DATA REPRESENTATIVE OF CALENDAR YEAR 1975
REGULATIONS AND GROWTH FACTORS APPLIED TO 1970 INVENTORY

	Counties				
Source Category	Addison	Chittenden	Franklin	Grand Isle	Rutland
I Fuel Combustion - Stationary Sources					
A. Area	39	111	51	8	70
B. Point	33	67	36	0	28
C. Total	72	178	87	8	98
II Process Losses					
A. Area	226	915	291	34	489
B. Point	30	0	0	0	0
C. Total	256	915	291	34	489
III Solid Waste Disposal					
A. Area	376	1530	485	55	815
B. Point	0	0	0	0	0
C. Total	376	1530	485	55	815
IV Transportation Area	1389	4041	1313	405	3593
V Miscellaneous Area	145	320	127	40	314
VI Grand Totals					
A. Area	2175	6917	2267	542	5281
B. Point	63	67	36	0	28
C. Total	2238	6984	2303	542	5309

TABLE 4.26
CARBON MONOXIDE EMISSIONS SUMMARY (TONS/YEAR)
VERMONT INTRASTATE AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1975

Source Categories	Counties								
	Bennington	Caledonia	Essex	Lamoille	Orange	Orleans	Washington	Windham	Windsor
I Fuel Combustion - Stationary									
A. Area Sources	89	86	22	52	72	77	181	118	162
B. Point Sources	6	6	295	2	0	20	0	4	13
C. Total	95	92	317	54	72	97	181	122	175
II Process Losses									
A. Area Sources	10	0	0	0	0	0	0	0	0
B. Point Sources	1122	409	0	0	0	0	64	0	243
C. Total	1132	409	0	0	0	0	64	0	243
III Solid Waste Disposal									
A. Area Sources	1293	1005	239	588	780	1047	2152	1450	1910
B. Point Sources									
C. Total	1293	1005	239	588	780	1047	2152	1450	1910
IV Transportation Area Sources	10670	7622	1774	4686	6436	3644	17073	15748	2538
V Miscellaneous Area Sources									
VI Grand Totals									
A. Area Sources	12062	8713	2035	5236	7288	4768	19406	17316	4610
B. Point Sources	1128	415	295	2	0	20	64	4	256
C. Total	13190	9128	2330	5328	7288	4788	19470	17320	4866

TABLE 4.27
NITROGEN DIOXIDE EMISSIONS SUMMARY (TONS/YEAR)
VERMONT INTRASTATE AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1975

Source Categories	Counties								
	Bennington	Caledonia	Essex	Lamoille	Orange	Orleans	Washington	Windham	Windsor
I Fuel Combustion - Stationary									
A. Area Sources	319	315	64	202	288	267	624	343	542
B. Point Sources	130	72	1280	12	9	50	105	86	400
C. Total	449	387	1344	214	297	317	729	429	942
I Process Losses									
A. Area Sources	0	0	0	0	0	0	0	0	0
B. Point Sources	0	0	0	0	0	0	0	0	0
C. Total	0	0	0	0	0	0	0	0	0
I Solid Waste Disposal									
A. Area Sources	92	71	17	43	56	63	151	104	151
B. Point Sources									
C. Total	92	71	17	43	56	63	151	104	151
V Transportation Area Sources	2379	1699	469	1029	1410	957	2737	2951	543
V Miscellaneous Area Sources									
I Grand Totals									
A. Area Sources	2790	2085	550	1274	1754	1287	3512	3398	1236
B. Point Sources	130	72	1280	12	9	50	105	86	400
C. Total	2920	2157	1830	1286	1763	1337	3617	3484	1636

TABLE 4.28
HYDROCARBON EMISSIONS SUMMARY (TONS/YEAR)
VERMONT INTRASTATE AIR QUALITY CONTROL REGION 221
DATA REPRESENTATIVE OF CALENDAR YEAR 1975

Source Categories	Counties								
	Bennington	Caledonia	Essex	Lamoille	Orange	Orleans	Washington	Windham	Windsor
I Fuel Combustion - Stationary									
A. Area Sources	51	56	11	35	51	47	106	60	95
B. Point Sources	4	1	251	3	3	20	5	6	55
C. Total	55	57	262	38	54	67	111	66	150
II Process Losses									
A. Area Sources	505	393	93	230	305	347	843	570	760
B. Point Sources	0	0	0	0	0	0	0	0	0
C. Total	505	393	93	230	305	347	843	570	760
III Solid Waste Disposal									
A. Area Sources	455	354	84	208	668	314	742	514	687
B. Point Sources									
C. Total	455	354	84	208	668	314	742	514	687
IV Transportation Area Sources	1899	1354	346	833	1143	764	2616	2485	412
V Miscellaneous Area Sources	219	156	43	100	145	92	270	310	55
VI Grand Totals									
A. Area Sources	3129	2313	577	1406	2312	1546	4577	3939	1325
B. Point Sources	4	1	251	3	3	20	5	6	55
C. Total	3133	2314	828	1409	2315	1566	4582	3945	1380

4.2.6.4 Growth Factors for Emissions of Carbon Monoxide, Nitrogen Dioxide and Hydrocarbons

Growth factors for projecting emissions of carbon monoxide, nitrogen dioxide and hydrocarbons are listed in this section. These growth factors were obtained in the same manner as described in Section 4.2.6.2. The predominant factor for these pollutants is automotive transportation which is shown separately. Area source increases were based on projected population growth. Industrial and commercial fuel sources were used to weight growth by industrial classification. Process losses were weighted by process weight input rate by industrial classification.

TABLE 4.29 GROWTH FACTORS

Source Category	Carbon Monoxide	Nitrogen Dioxide	Hydro-Carbons
I Fuel Combustion - Stationary Sources			
A. Area	1.14	1.14	1.14
B. Point	1.27	1.27	1.27
II Process Losses			
A. Area	1.24	1.19	1.24
B. Point			
III Solid Waste Disposal			
A. Area	1.14	1.14	1.14
B. Point			
IV Transportation			
Area	1.256	1.256	1.256
V Miscellaneous			
Area	1.14	1.14	1.14

4.3 Comparison of Vermont Regulations with 42 CFR 420 Appendix B

Appendix B of 42 CFR 420, "Requirements for Preparation, Adoption and Submittal of Implementation Plans," Federal Register Vol. 36, No. 158, August 14, 1971 sets forth emissions limitations which, in the Administrator's judgment, are attainable through the application of reasonable available emission control technology. Vermont regulations are compared with those of Appendix B in this section.

Figure 4.11 shows a comparison of those regulations based on particulate emissions from fuel burning equipment. Pounds of emission per million BTU's heat input are shown on the figure for Vermont. Federal Regulations are a constant value .3 lbs. per million BTU's heat input. The federal regulation of 0.3 pounds per million BTU's is based on the entire EPA stack test train while Vermont's regulations are based on only the dry portion of the train. The EPA test train for testing combustion sources consists, in sequence, of a probe in the stack, a filter or cyclone collector for dry particulates, two water filled impingers, a dry impinger, a silica gel drying area followed by a pump and dry gas meter. The purpose of the water filled impingers is to collect condensate that is in vapor form in the stack but will condense to form droplets or particulates at atmospheric temperature. The Vermont regulations apply only to particulates caught by the probe and filter before the impingers, i.e. matter that is in particulate form in the stack itself. Any stack tests in Vermont conducted to indicate compliance with this regulation will be concerned with only the dry portion of the test train.

Figure 4.12 shows the comparison of maximum weight of discharge in tons per hour for industrial processes. The curves are very similar in this case. In addition the Vermont particulate regulations require that any boilers

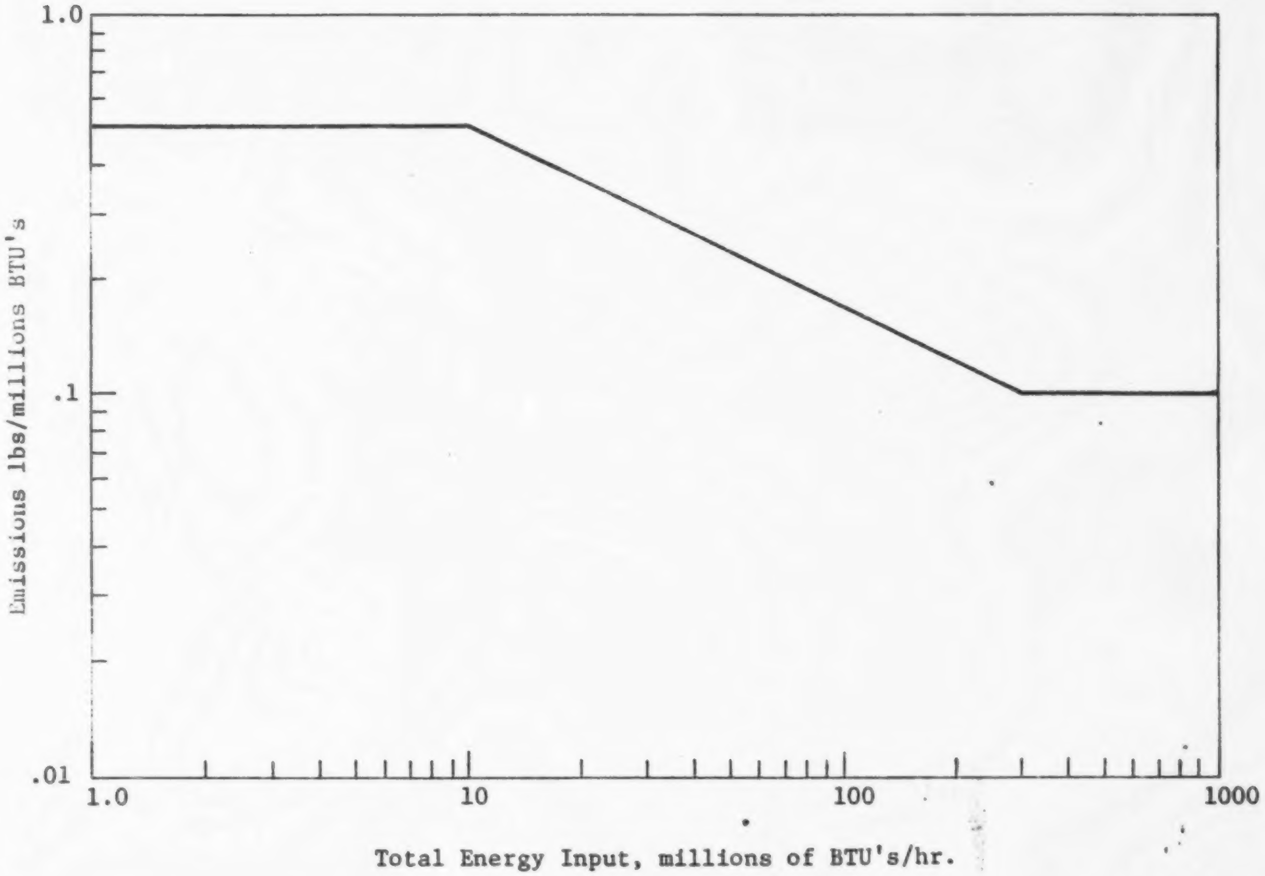

Fig. 4.11 Fuel burning equipment allowable particulate emissions, Vermont Regulations.

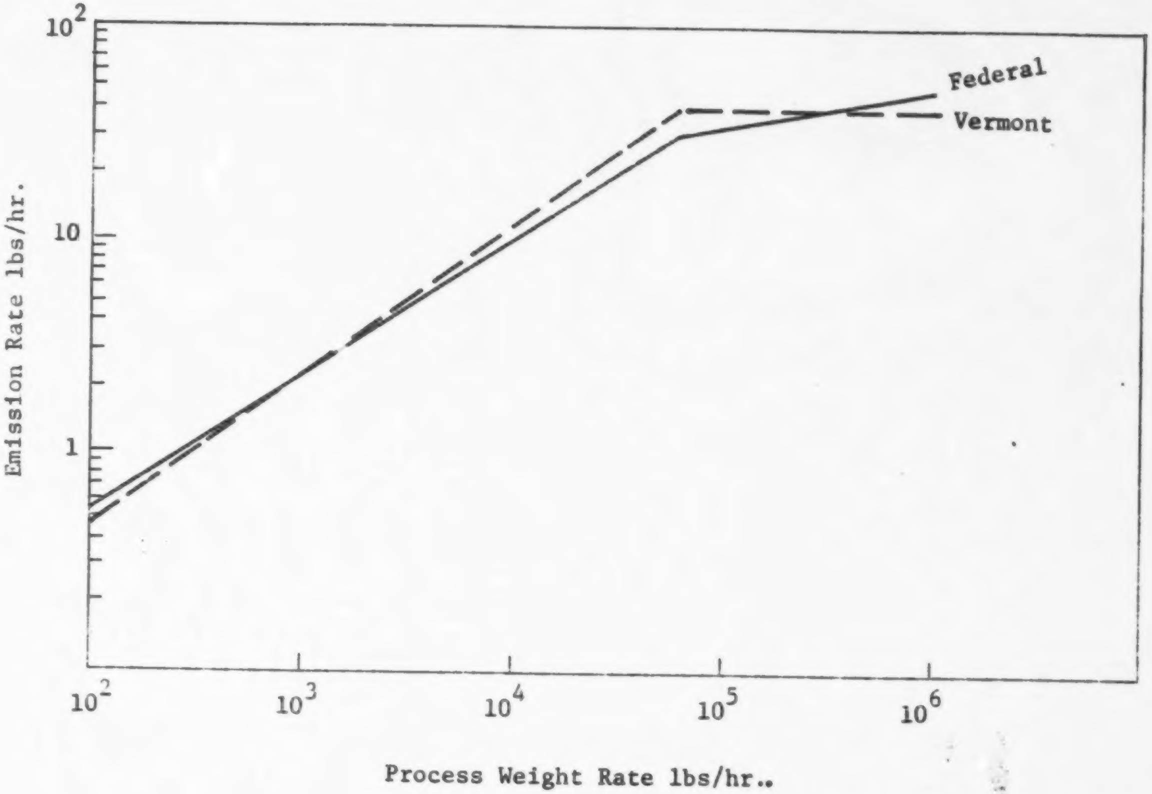

Fig. 4.12 Comparison of Vermont Regulations with Federal Guidelines for process weight emissions of particulate matter.

constructed after July 1, 1971, be limited to .02 lbs. per hour per million BTU's heat input where the heat input is rated greater than 1,000 million BTU's per hour.

Incinerator emissions are limited to .10 lbs. per 100 lbs. of refuse* burned. The Appendix B Regulations are .20 lbs. per 100 lbs. of refuse burned.

Sulfur dioxide emissions are limited by sulfur content of fuel or by equipment which will remove sulfur compounds from the stack gases to the extent that the emission of sulfur compounds into the atmosphere are no greater than those that would be emitted under the fuel regulations. The fuel regulations limit the sulfur to not more than 2.2% by weight by October 1, 1971, not more than 1.5% sulfur by weight by October 1, 1972, and not more than 1% by weight by October 1, 1974.

Nitrogen oxides are restricted for combustion installations with a capacity of 250 million BTU's or more completed after July 1, 1971, to not more than .30 lbs. per million BTU's of heat input per hour. Federal guidelines limit discharge to .30 lbs. per million BTU's of heat input per hour without regard to size of the installation.

All other regulations are the same as those in Appendix B. Automobile emissions are expected to be the same as Federal Regulations required.

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* These emission rates are comparable because Vermont's regulations are based on only the dry portion of the stack test train and the Federal standards are based on the total stack test train.

5.0 COMPLIANCE SCHEDULES

Vermont Health Regulations, Part 5, Chapter 4, Air Pollution, are attached as Appendix B to this document. These regulations were effective as of August 10, 1971. The sections dealing with compliance all provide that emissions shall be reduced to achieve and maintain air quality standards prior to January 1, 1975.

Effective immediately, no person shall engage in open burning of refuse, except burning in forest land areas of brush, tree-cuttings, and slash, where the cuttings accrue from pulping lumber and clearing of initial rights-of-way, provided no public or private nuisance is created. Open burning related to clearing of initial rights-of-way in forest land will be considered permissible until September 1, 1973.

Prohibition of visible air contaminants is limited with two dates. Those installations constructed prior to April 30, 1970 may not permit the emission of any air contaminant for more than a period or periods aggregating six minutes in any hour which has a shade or density greater than Number 2 of the Ringelmann Chart. This became effective January 1, 1971 except that, if an abatement schedule was submitted and approved by the Director before January 1, 1971, and the person installs the equipment necessary for full compliance with the regulations no later than January 1, 1972, the regulation was assumed to have been met. Installations constructed subsequent to April 30, 1970 shall not emit visible air contaminant for more than a period or periods aggregating six minutes in any hour which has a shade or density greater than Number 1 of the Ringelmann Chart. At no time shall any emissions have a shade, density or appearance greater than Number 3 of the Ringelmann Chart.

Sulfur limitations in fuel are being used to control sulfur dioxide emissions. The schedule for compliance is by October 1, 1971, not more than 2.2% sulfur by weight; by October 1, 1972, not more than 1.5% sulfur by weight; and by October 1, 1974, not more than 1% sulfur by weight shall be used in the State of Vermont. The provision of these regulations shall not apply where sulfur compounds are removed from the stack gases to the extent that the emission of sulfur compounds to the atmosphere is no greater than that which would be emitted under the fuel regulations.

Industrial process emissions are limited, with the effective date of the regulations in the manner shown in Table 1 of the regulations in Appendix B.

Incinerator emissions are limited in that all incinerators built and installed after July 1, 1971 shall be multiple chamber incinerators or equipment found by the Director to be equally effective for the purpose of air pollution control. In no event shall any incinerators, existing or proposed, emit exhaust gases that have particulate matter exceeding 0.10 pounds per 100 pounds of refuse burnt. Combustion contaminants are limited in the manner set forth in Figure 1 except for stationary industrial gas turbine utilized as a combustion installation, in which case the regulations become effective July 1, 1972.

Control of nitrogen oxides emissions is limited in that any installation with a capacity of 250 million BTU or more, completed after July 1, 1971, shall not emit in excess of 0.30 pounds per million BTU's of heat input per hour. The provisions shall not apply to stationary industrial gas turbines utilized as a combustion installation until July 1, 1973.

The State is relying on Federal regulations for the control of motor vehicle emissions. The compliance schedule, therefore, follows the compliance schedule required by Federal regulations for exhaust for motor vehicles.

Title 10, Vermont Statutes Annotated, Section 361 (Appendix A to this plan) deals with variances from the compliance schedules established by regulations. Time schedules to achieve compliance must be submitted to the Air Pollution Control Officer. If the schedule calls for compliance later than 18 months from the date of approval of the implementation plan, then the schedule must show periodic increments of progress toward achieving compliance. All individually negotiated time schedules and abatement schedules will be submitted to the Federal Environmental Protection Agency Administrator with the first semi-annual report of progress toward achievement of standards.

No compliance time schedule or abatement schedule will extend beyond the date of achievement of national air quality standards.

6.0 EMERGENCY EPISODE PLAN

Stagnant high pressure weather systems, with their accompanying light winds and poor ventilation, may lead to high pollutant concentrations. This type of meteorological situation does not permit locally generated pollutants to be mixed and diluted by the atmosphere so that concentrations can build to high levels over a period of several days. Fortunately, these systems do not occur very frequently in the New England area. According to the National Weather Service, there were seven occurrences involving 33 days from 1936 to 1965 at Burlington. During the same period, Nashville, Tennessee had 76 cases totaling 369 days of stagnating conditions. No stagnation episodes lasted 7 days but all occurrences lasted 4 days or more. Vermont may expect a stagnation situation about once every three years.

Far more typical of Vermont weather governing dilution are the daily effects of temperature inversions in the valley that are eliminated by solar heat and wind induced turbulence by about 10 a.m. These inversions may lead to locally high concentration levels for brief periods but do not result in the buildup of contaminants requiring emergency action.

Four major population centers exist in Vermont consisting of areas around Burlington, Rutland, Barre-Montpelier and Brattleboro. Measurements obtained during the period from July 1970 through June 1971 indicate no concentrations or combinations of concentrations approaching Federal guidelines for establishing episode alerts. Regulations governing new sources will offset population, automotive and industrial growth so that emergency episodes should not occur in the future. These regions were designated priority II and III because of low concentrations observed and there is a very low probability that emergency action will be required. Action will be taken at the alert and warning levels to avoid reaching emergency air quality levels.

Equipment is already in place for monitoring air quality during air pollution emergency episode stages. The stations selected for monitoring these events are in Burlington and Barre. Continuous SO_2 monitoring stations at Barre, Burlington and Rutland will be utilized in the event of an emergency episode. Tape samplers will be monitored at Barre and Burlington.

In the event that air quality levels warrant emergency action, the State has established legal authority for the necessary abatement. The State Board of Health, with the concurrence of the Governor of Vermont, may order persons causing or contributing to the air pollution to reduce or discontinue immediately the emission of air contaminants under authority of Section 360, Title 10 Vermont Statutes.

The National Weather Service high pollution level forecasts will be used to establish the fact that poor dilution is expected and concentration levels will be monitored for increases to levels of concentration consistent with episode criteria. Two levels of criteria are established.

Conditions justifying the proclamation of an air pollution alert, air pollution warning or air pollution emergency shall be deemed to exist whenever the Director of Industrial Hygiene determines that the accumulation of air pollutants in any place is attaining or has attained levels which could, if such levels are sustained or exceeded, lead to a substantial threat to the health of persons. In making this determination, the Director will be guided by the following criteria and those values shown in Table 6.1.

Alert Level - The alert level is declared when concentration of pollutants judged to be deleterious to the general public is expected to occur and is the signal for the first stage control action to begin. An alert will be declared when any one of the air quality criteria established in Table 6.1 is met and meteorological conditions are such that the conditions can be expected to continue for 12 or more hours.

Warning Level - The warning level indicates that air quality is continuing to deteriorate and that additional abatement action will be necessary. A warning is declared if any one of the criteria established for this level is met and meteorological conditions are such that this condition is expected to continue for 12 or more hours.

Surveillance of air quality will be performed manually and telephoned to the Director of Industrial Hygiene. Interpretation will be made by the Director of Industrial Hygiene, and the reduced data will be given to the Secretary, Agency of Environmental Conservation.

Sources will be asked to cooperate voluntarily, at the alert level, to reduce their emissions. Voluntary cooperation can be very effective in the reduction of emissions. The purpose of voluntarily reducing emissions is to prevent an emergency or warning level from occurring so that large reductions of emissions are not required. Should large reductions be required, these reductions may have to be obtained by utilization of the emergency powers of the Department of Health.

Impending or existing alert conditions will be communicated to the Vermont State Department of Health, Commissioner of Public Safety, news media, and radio and television stations by the Secretary, Agency of Environmental Conservation.

Impending or existing warning level conditions will be communicated to the State Department of Health, Commissioner of Public Safety, news media, including radio and television stations, and other agencies approved for notification by the Secretary, Agency of Environmental Conservation. All sources will be asked to voluntarily reduce operations to minimize emissions during the period of poor dilution creating concentrations at the warning level.

TABLE 6.1

EPISODE CRITERIA FOR VERMONT

Alert Level

SO_2 - 800 μg/m^3 (0.3 ppm), 24-hour average

Particulate - 3.0 COHs or 375 μg/m^3 , 24-hour average

SO_2 and particulate product - 0.2; product of SO_2 (ppm) 24-hour average and COHs

CO - 17 mg/m^3 (15 ppm), 8-hour average

Oxidant (O_3) - 200 μg/m^3 (0.1 ppm), 1-hour average

NO_2 - 1130 μg/m^3 (0.6 ppm), 1-hour average or 282 μg/m^3 (0.15 ppm), 24-hour average

Warning Level

SO_2 - 1,000 μg/m^3 (0.6 ppm), 24-hour average

Particulate - 6.0 COHs or 750 μg/m^3, 24-hour average

SO_2 and particulate product - 0.8; product of SO_2 (ppm), 24-hour average and COHs

CO - 34 mg/m^3 (30 ppm), 8-hour average

Oxidant (O_3) - 800 μg/m^3 (0.4 ppm), 1-hour average

NO_2 - 2260 μg/m^3 (1.2 ppm), 1-hour average or 565 μg/m^3 (0.3 ppm), 24-hour average

If an emergency episode does occur in Region 159, the interstate air quality control region, the State will be in contact with the appropriate officials of the State of New York to determine what action each State is taking during this emergency, to interchange data on air monitoring stations, and to mutually respond to the action of the other State. Although it is felt that the probability of such an emergency episode in this region is remote, planning conferences to interchange information on the region will be held at least once a year between State officials.

Additional equipment used by other agencies (such as the power company or State of New York) will be monitored during periods when high pollution level forecasts are in effect. The state will keep its channels of communications open with all levels of government during any emergency episode.

7.0 AIR QUALITY SURVEILLANCE

Existing air quality surveillance was discussed in Section 4 dealing with the Control Plan. Vermont proposes to continue most of the stations that are already in existence to maintain continuity of air quality data and to install new stations in accordance with Federal rules and regulations for priority II and III regions. Table 7.1 shows the Federal requirements and the Vermont proposal to meet these requirements, listing the location of the station by town within each region. Where types of samplers are not specifically specified in the Table, only those meeting Federal specifications will be used to measure ambient air quality. In addition to Table 7.1, Figure 7.1 shows the proposed sampling locations in relation to the urban development patterns presented earlier under description of the State. All sampling sites except the proposed high-volume sampler at Randolph and Shoreham are designed to be located in the area estimated to be maximum pollution concentration regions. Samplers will be operated on a random basis. The continuous samplers will be operated on all days of the month.

Data will be forwarded to the Industrial Hygiene Laboratory for analysis. High-volume sampler filter papers will be weighed and assessed by the laboratory, as will bubbler samples and paper tape samples. The data will be logged by the Division of Industrial Hygiene and monthly summaries will be made assessing average monthly levels of pollutant concentration, their standard deviation, and appropriate maxima as set forth in Appendix H of the Federal Register, Volume 36, Number 158, published August 14, 1971. Sampling stations are currently available in Burlington and Barre.

VERMONT IMPLEMENTATION PLAN
Table 7.1 (Additions)

Sampling Station Locations

Vermont Locations		UTM Coordinates		Saroad Site Identification	Agency Code	Method Code
Shoreham	1	630.7	4855.2	47-0020-001	F	91
Burlington A	1	641.9	4924.4	47-0140-003	F	91
Burlington B	1	640.4	4927.0	47-0140-004	F	91
Rutland	1	663.1	4829.8	47-0400-001	F	91
Winooski	(1)	641.5	4928.1			
Burlington A	1	641.9	4924.4	47-0140-003	F	81
Burlington A	1	641.9	4924.4	47-0140-003	F	11
Rutland	1	663.1	4829.8	47-0400-001	F	11
Shoreham	(1)	630.7	4855.2			
Winooski	(1)	641.5	4928.1			
Burlington A	1	641.9	4924.4	47-0140-003	F	14
Barre	1	697.5	4893.3	47-0040-001	F	91
Brattleboro	1	698.7	4745.0	47-0120-001	F	91
Randolph (NAS)	1	692.3	4866.2	47-0360-001	F & A	91
White River Jct.	(1)	717.0	4834.0			
Montpelier	(1)	693.0	4901.8			
Barre	1	697.5	4893.3	47-0040-001	F	81
Barre	1	697.5	4893.3	47-0040-001	F	11
Montpelier	(1)	693.0	4901.8			
Brattleboro	(1)	698.7	4745.0			
White River Jct.	(1)	717.0	4834.0			

( ) Indicates Proposed Locations
NAS Indicates National Air Sampling Network

Table 7.1

Sampling Station Locations in Vermont

	Federal Requirements	Vermont Locations		Coordinates	
Region 159		Shoreham (NAS)	1	630.7	4855.2
Particulates					
High Volume	3	Burlington A	1	641.9	4924.4
		Burlington B	1	640.4	4927.0
		Rutland	1	663.1	4829.8
		Winooski	1	641.5	4928.1
Tape	1	Burlington A	1	641.9	4924.4
Sulfur Dioxide					
Continuous	1	Burlington A	1	641.9	4924.4
		Rutland	1	663.1	4829.8
		Shoreham	(1)	630.7	4855.2
		Winooski	(1)	641.5	4928.1
Oxidants, CO, NO_2, HC		Burlington A	1	641.9	4924.4
Region 221					
Particulates					
High Volume	3	Barre	1	697.5	4893.3
		Brattleboro	1	698.7	4745.0
		Randolph (NAS)	1	692.3	4866.2
		White River Jct.	(1)	717.0	4834.0
		Montpelier	(1)	693.0	4901.8
Tape	1	Barre	1	697.5	4893.3
Sulfur Dioxide					
Continuous	1	Barre	1	697.5	4893.3
		Montpelier	(1)	693.0	4901.8
Bubbler	3	Brattleboro	(1)	698.7	4745.0
		White River Jct.	(1)	717.0	4834.0

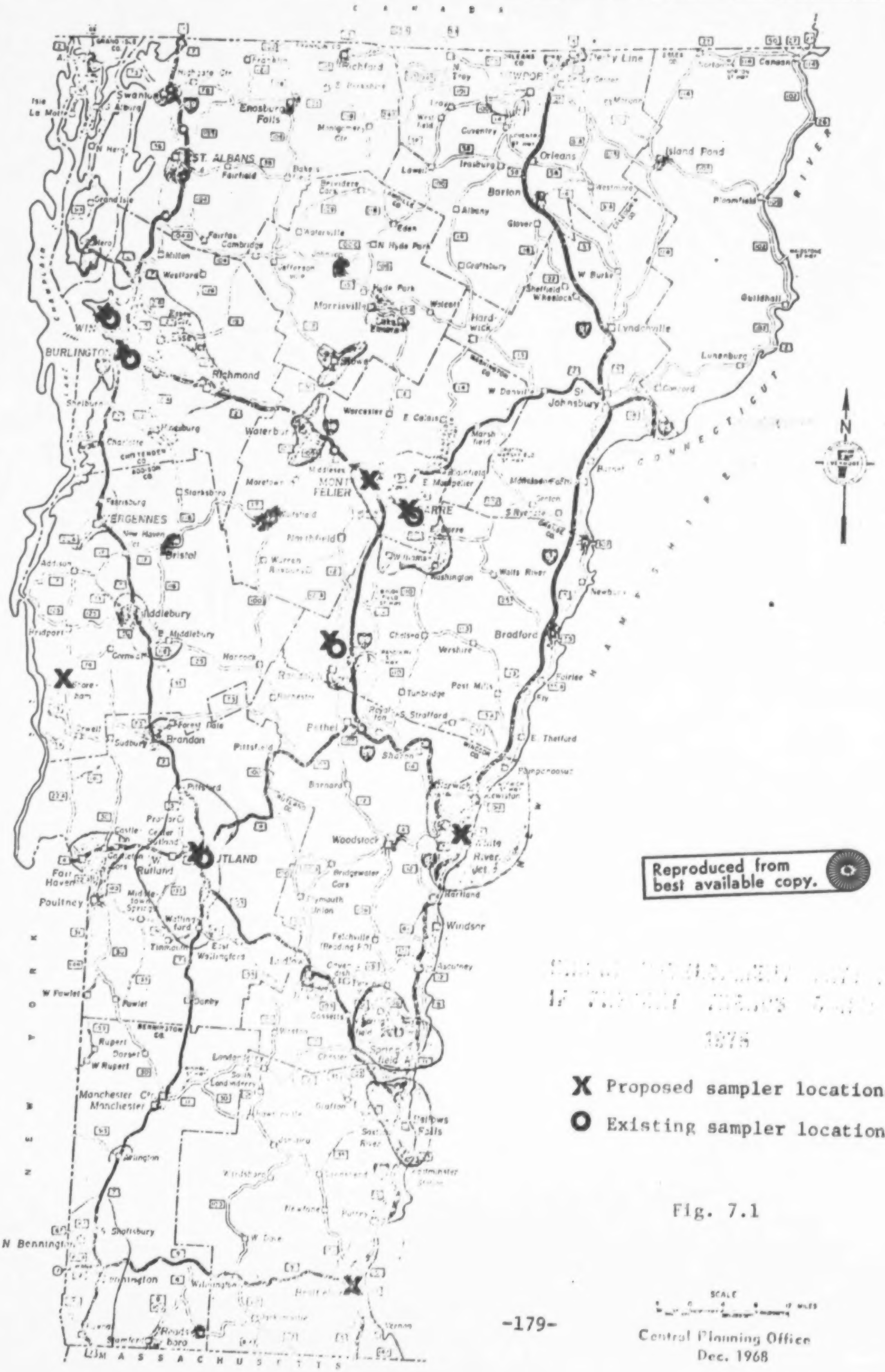
Vermont locations proposed denoted by ( )
NAS - National Air Sampling Network

Sampling stations are currently monitoring the ambient air for gaseous pollutants in Burlington and Barre. A complete sampling station is located in Burlington, at which the following parameters are measurement: sulfur dioxide, nitrogen dioxide, carbon monoxide, hydrocarbon, oxidant, particulate matter by hi-vol and tape sampler, and wind direction and speed. The Barre station measures particulate matter and sulfur dioxide. An oxidant measurement is made at Underhill through the cooperation of the University of Vermont, Agricultural Experimental Station. Particulate matter measurements utilizing the high volume sampling are currently being made at two additional stations in Burlington, Brattleboro, Shoreham, Rutland and Randolph.

Proposed sampling stations when completed will consist of high volume sampling, and a continuous or bubbler measurement of sulfur dioxide. The following is a schedule of installation of these completed stations.

Rutland	December, 1971
Winooski	Spring, 1972
Shoreham	Spring, 1972
Montpelier	Fall, 1972
White River Junction	Spring, 1974
Brattleboro	Spring, 1974

High volume samples will be collected daily through December 1971 to acquire the maximum information possible on particulate air quality in the shortest possible period of time. After this date, it is anticipated that the high volume samples will be on a random basis. In accordance with the Federal requirements on random sampling for hi-vols, at least 61 samples will be taken during the calendar year. One 24-hour bubbler sample for SO_2 will be collected every six days.


CANADA
Swanton
ST. ALBANS
Enosburg Falls
Richford
Newport
Island Pond
Orleans
Barton
Morrisville
Stowe
BURLINGTON
Richmond
Waterbury
MONTPELIER
BARRE
St. Johnsbury
Lyndonville
VERGENNES
Bristol
Middlebury
Brandon
RUTLAND
Bethel
Woodstock
White River Jct.
Windsor
Springfield
Bellows Falls
Manchester
Brattleboro
Bennington
NEW YORK
MASSACHUSETTS
CONNECTICUT RIVER
NEW HAMPSHIRE
N
SCALE

Reproduced from best available copy.

[illegible]
[illegible]
1975

X Proposed sampler locations

O Existing sampler locations

Fig. 7.1

Central Planning Office
Dec. 1968

Methods of measurement currently employed are:

SO_2 - modified West-Gaeke on a continuous basis or 24-hour gas bubbler with West-Gaeke analysis

NO_x - Saltzman reagent in a continuous sampler

CO - nondispersive infrared on a continuous basis

Oxidants - Mast ozone meter to be replaced by a continuous chemiluminescence method in 1972

Hydrocarbons - flame ionization on a continuous basis.

At the present time, all data reduction is done manually. However, during this fiscal year, monies have been allotted to the purchase of a data reduction system for the main Burlington station. This system will reduce the data for 7 parameters. Instead of strip chart readings, all the data will be reduced to a paper or magnetic tape, thus allowing ready reduction of the data via data processing equipment. Computer time is available to the Agency, and investigations are being carried out by the staff to utilize data processing equipment. It is anticipated that all air quality data will be reduced by data processing equipment by December, 1972. Manual reduction will be continued until automated processing is accomplished.

8.0 REVIEW OF NEW SOURCES

Vermont does not have a formal permit system at this time; however, the Chairman of the House Natural Resources Committee will introduce legislation for consideration in the reconvened legislative session in January, 1972 to provide authority to promulgate regulations for a permit system. This proposed legislation is attached as Appendix D. The existing authority for review of new sources presently available to the State is contained in Vermont Health Regulations Part 5, Chapter 4 (Appendix B) and in Section 356 of Title 10, Vermont Statutes Annotated (Appendix A).

The Director of Industrial Hygiene may require written reports from persons operating or responsible for any air contaminant source. These reports shall include the location, size, and height of contaminant outlets, processes employed, fuels used, nature and time periods of duration of emissions, and such other information relative to air pollution and available or reasonably capable of being assembled, as determined necessary and requested by the Director. These written reports are required by subsection 5-412 of the Vermont Health Regulations, Part 5, Chapter 4, Air Pollution. In addition, under Section 356 of Title 10, Vermont Statutes Annotated, the State Board of Health may require that notice be given to it prior to the undertaking of the construction or installation of classes of new air contaminant sources specified within its rules and regulations. The State Board of Health may prohibit the construction of the installation or establishment if it will be in violation of its rules and regulations.

Whenever the Director has reason to believe that emission limits of these regulations are being violated by new sources or modified sources, he may require the owner to conduct tests to determine the particulate matter emission level and these tests shall include stack tests, if the circumstances so demand. This authority is contained in Section 5-483 of the Vermont Air Pollution Control Regulations. The method or conditions associated with the method for source testing must be approved by the Director, Division of Industrial Hygiene.

9.0 SOURCE SURVEILLANCE

9.1 Records and Reporting

Vermont regulations require owners and operators of stationary sources to maintain records and reports when requested by the State. Specifically, under Section 5-412, the Director, Division of Industrial Hygiene, may require a written report from a person operating or responsible for any air contaminant source. The report shall include the location, size, and height of the contaminant outlets, processes employed, fuels used, nature and time periods of duration of emissions, and such other information determined necessary and requested by the Director. The emission and source inventory will be updated the beginning of each calendar year. Emission report forms, similar to those utilized in the initial inventory and included in this section as Figure 9.1, will be sent to all significant point sources during January of each year. This information will be required under the authority granted to the Director. A significant point source is one that causes emissions in excess of 25 tons a year of any pollutant for which there is a national standard or meet the criteria stated in Section 420.1 (42 CFR 420). Due to the small number of sources that meet these criteria in Vermont, it is expected that all sources currently listed as point sources in the emission inventory can be queried on an annual basis. The Vermont inventory identified 38 point sources in the Champlain Valley Air Quality Control Region, and 22 point sources in the Intrastate Air Quality Control Region. The information from the periodic emission reporting forms, all prior data, inspections, etc. will be combined with the variables that could influence area emission in the updating of the emission inventory.

STATE OF VERMONT
INDUSTRIAL HYGIENE DIVISION
AIR POLLUTION CONTROL PROGRAM

32 Spaulding Street
P.O. Box 607
Barre, Vermont 05641

AIR QUALITY SURVEY

I. Plant Name ______________________ Phone ____________

Address ______________________ County ____________

Date Questionnaire Completed ____________

Name and Title of person completing questionnaire ______________________

Provide Data for the Year 1970

II. General Plant Information:

A. Major Type of Business:

Manufacturing _____ Commercial _____ Other ____________

B. Products manufactured or services sold:

1. ____________ 4. ____________
2. ____________ 5. ____________
3. ____________ 6. ____________

C. Normal operation:

Hours per day _____ Days per year _____ Shifts per day _____

INSTRUCTIONS

1. Use accurate estimates when records are not available.
2. Answer all questions. If certain questions are not applicable to your activity, please indicate none or not applicable.
3. If more space is necessary, use back of sheets or attach other sheets.
4. Any supplemental material or data considered pertinent (as reports, summaries, test results, maps and flow diagrams) may be attached and would be appreciated.

Note: In order to facilitate compiling of all information for completion of this survey it would be greatly appreciated if completed forms are returned by ____________

Figure 9.1

III. Fuel Consumption (For heat, steam power or electric generation)

A. Type and Number of Units (Burners, Boilers, Warm Air Furnaces, etc.)

____

Rating (Horsepower, pounds of steam per hour, BTU per hour input, G.P.H. Firing Rate, etc.) ______________________________

____

B. Type of Fuel (Bituminous coal, #2 Fuel Oil, LP Gas, Wood, etc.)

Type of Fuel	Quantity per year*	% Used for Heating, Power, etc.	Remarks

*Give Fuel Quantities in Pounds, Tons, Gallons, Cubic Feet, etc.

C. Fuel Percent Sulfur Content ______ Fuel Percent Ash

Fuel Supplier is ______________________________

Fuel Supplier's Address ______________________________

D. Type of Coal Equipment Used ______________________________
(Pulverized Coal, Stoker, Handfired, etc.)

E. Air Cleaning Equipment Used on Fuel Burning Operation _____Yes _____No

Type ______________________________

Percent Efficiency ______________________________

Remarks ______________________________

F. Give type, quantity, and month of highest amount of fuel consumption.
(As 3500 gallons of #2 Fuel Oil in January, 1970).

____

____

*Note: Future version of this form will require stack height, stack diameter, gas flow rate, exit gas temperature, and exit gas velocity.

Figure 9.1 (continued)

G. If available, give monthly record of fuel consumption.

Month	Fuel	Quantity
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

IV. Combustible Waste Disposal (includes wood wastes, scrap lumber, paper, rags, cartons, solvents, garbage, paint, rubber, plastics, carcasses, etc.)

A. Type of Waste (include salvage operation combustion - such as wire reclamation, automobile burning).

Type of Waste	Quantity per year*	Method of disposal	Remarks

B. Do you have an incinerator ____Yes ____No

Name and Type (Multiple chamber, after burner, include model number, etc.)

____

Manufacturer's Rated Capacity ____________________Pounds/Hour

Average Operation of Incinerator ____Hours Per Day

Auxiliary Fuel Used in Incinerator (L.P. Gas, #2 Fuel Oil, Electricity, etc.)

Type ____________________Quantity Per Year ____________

C. Air Cleaning Equipment Used on Incinerator ____ Yes____No.

Type ____________________Percent Efficiency ____________

*Give Quantities in Pounds, Tons, Gallons, Etc.

Figure 9.1 (continued)

V. Process Equipment and Operations *

Process or Operations Releasing Contaminants or Being Exhausted to the Atmosphere (1)	All Materials Processed and or Used (2)		Type and Name of Air Cleaning Equipment (3)	Dust, Fumes, Gas Emitted (4)		Basis of Estimate (5)
	Type	Quantity		Type	Quantity	

*Examples: (1) Brief Description of any process or process operation which would emit, no matter to what degree, anything to the outside air--casting, spraying, degreasing, sanding, melting, mineral crushing, core baking.

(2) Give type and quantity of all materials entering a process and all leaving. 5 tons iron castings cleaned per day, 10 gallons solvent used for cleaning per day, 6,000 lbs. wood pulp produced per day, etc., 6 ton of wood into process, 5 ton of product out, ½ ton scraps, ½ ton dust collected in cyclone per week, daily and annual figures are helpful.

(3) Wet scrubber, cyclone, settling chamber, give manufacturer's name, size information, baghouse, electrostatic precipitator, etc.

(4) Iron oxide, silica dusts, wood sawdust, sanding dust, lbs. per day, tons per month, lbs. emitted per lb. produced or other convenient units. If possible give quantity of process exhaust in cubic ft. per minute (CFM).

(5) Material balance, tests by plant personnel or equipment manufacturer, assumption, etc.

Note: For intermittent operations indicate approximate frequency and duration so that an estimate of yearly emissions may be made; such as in a foundry, indicate melting schedule, or in an asphalt plant, indicate operation schedule.

Figure 9.1 (continued)

This compilation will be completed in February of each year.

9.2 Periodic Testing and Inspection

Whenever the Director has reason to believe that emissions limits of the Vermont regulations are being violated, he may require the owner to conduct tests to determine the particulate matter emission level under Section 5-483 of the Air Pollution Regulations. These tests shall include stack tests if circumstances so demand, and the Director may require such tests be conducted in the presence of representatives of the Agency. Furthermore, the method employed in stack testing must be approved by the Director of the Division of Industrial Hygiene. Under the same Section, the Director may wish to conduct tests of his own to determine compliance with emissions limits and the owner shall provide at no expense to the State of Vermont reasonable and necessary openings in stacks, vents, and ducts, along with safe and easy access thereto, including a suitable power source to the point of testing.

Personnel in the Division have the responsibility to monitor sources on a routine basis. Their function is to periodically inspect and test stationary sources for possible violation of Vermont emissions regulations. These inspectors will visit sources emitting 25 tons per year of any pollutant (64 sources at present) not less than once each year and more frequently if so instructed by the Director. Installations having process emissions shall be visited on a basis consistent with the process weight rate. Any installation having a process weight rate of 10,000 pounds per hour or more (25 sources) shall be inspected at least annually. In no event will visits to stationary sources be made less than once each three years to ensure compliance with particulate emissions requirements.

Sulfur dioxide emissions requirements shall be measured by obtaining samples of fuel sold to the various installations and determining the sulfur content. Fuel from major distributors will be sampled on a quarterly basis to ensure that the sulfur content meets the requirements set forth in the Vermont regulations. Samples will be obtained at least annually from all distributors of fuel within the State. This shall apply only to those distributors of coal and residual fuel oil.

9.3 Detection of Violations of Regulations

Many violations of regulations will be detected during the periodic inspections by staff personnel. Part time personnel trained in visible emission evaluation will be used exclusively for detection of these violations. In the Burlington area, citizen monitors report alleged violations to a citizen who has been trained in visible emission evaluation. This trained citizen then monitors the source for violation of visible emission regulations. An example of the evaluation form is shown as Figure 9.2. These violations are immediately subject to Act 93.

The mainstay of the detection program is the citizen. Citizen complaints are given the highest priority by staff personnel. It is hoped that a major impediment to not having more citizen complaints will be alleviated when a toll free complaint number throughout the State is implemented during next year. Complaints are recorded on forms (Figure 9.3) included in this section. An investigation is conducted as soon as possible to determine if a violation of the regulations had occurred. All pertinent information is

STATE OF VERMONT
Agency of Environmental Conservation
Division of Industrial Hygiene
Barre, Vermont 05641

Visible Emission Evaluation

Date ____________

Location Source ______________________________

Observer __________________________

Address ______________________________

____

County ______________________________

Observation Point ______________________

____

Stack - Distance From _____ Height _____

Wind - Speed _____ Direction ______

Type of Installation ______________________

____

Fuel ______________________

Observation Began ___________

Ended ___________

Minutes greater than

No. 2 (40%) ________

Minutes greater than

No. 3 (60%) ________

Violation Yes _____ No _____

	0	15	30	45		0	15	30	45
0					30				
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				

Remarks ______________________________

____

____

____

Owner/Manager ______________________________

Address ______________________________

Figure 9.2

AIR POLLUTION COMPLAINT FORM

Complaint made by: ______________________ Date: ______________

Address: ______________________ Telephone: ______________

Complaint: ____

____

____

____

____

Name of Plant: ______________________ Date of visit: ______________

Address: ______________________ Telephone: ______________

Official interviewed: ____________________________________

Inspection and action: ____________________________________

____

____

____

____

____

____

____

____

____

____

____

VIOLATION: ______ YES ______ NO

BY: ____

Figure 9.3

recorded on the complaint form. Visible emission evaluations are recorded on a special form. The citizen who initiates the complaint is contacted after the investigation is conducted so that he can be informed as to the disposition of his complaint.

9.4 Disposition of a Violation

Primary enforcement is on visible emissions and open burning at this time. If a violation occurs, the State may follow one of the four procedures listed below.

1) The State Board of Health may issue an order to cease and desist. This procedure is used for recurring violators such as those guilty of open burning. If the orders of the State Board of Health are not complied with, the State may proceed with criminal prosecution through the State Attorney's Office.

2) If deemed appropriate, the State Board of Health may institute direct criminal action through the State Attorney's Office.

3) If deemed appropriate, the State Board of Health may institute civil action through the Office of the Attorney General.

4) Act 93 of the 1971 legislature (Appendix C) established a procedure whereby the State and the alleged violator hold a conference before a hearing officer. If an abatement schedule can be agreed upon, the State and the alleged violator sign an assurance of discontinuance of the violation.

10.0 RESOURCES

Manpower required to carry out the State's air pollution control program is shown in Table 10.1. The present manpower is indicated in the first column. Manpower estimates to meet the 1973 and 1975 requirements are shown in the second and third columns.

Agency fund estimates are shown, by function, in Table 10.2. Vermont intends to rely on the State agency for primary responsibility to enforce regulations. Local agencies will be helpful on a cooperative basis and will not replace the State requirements.

Funding for the air pollution control program is obtained through State and Federal monies. Federal funds are granted to the State under section 105, Clean Air Act, as amended (December 31, 1970). The State is currently in the first year of an improvement grant. Under this grant, a certain portion of the State's expenditures for air pollution control is matched by Federal funds on a 3:1 (Federal to State) basis. The duration of an improvement grant is usually three years. Therefore, until fiscal year 1973, only marginal increases of the State's contribution will be necessary to meet the projected budget levels.

At the termination of this Federal improvement grant, it is anticipated that the State will qualify for future Federal support under the maintenance provisions of the Clean Air Act, as amended. Under a maintenance grant, the entire State contribution is eligible for matching purposes on a ratio of 5:3 (Federal to State). It should be noted that funding is on a continuous basis, provided that funds are made available by Congress. No additional "new State monies" are required each year. With this Federal grant, it is estimated that State expenditure for the total air pollution control program will have to be increased by $24,000 to meet the projected budget figures for 1975.

Table 10.1

Control Agency Functions

Man-year estimates by function for Vermont AQCR 159 and 221.

Function	Present	1973	1975
Enforcement Services	(2.52)	(3.60)	(4.04)
Scheduled Inspections	2.17	3.20	3.48
Complaints and Field Patrol	.35	.40	1.56
Engineering Services	(.96)	(1.25)	(1.36)
Permit System	.61	.78	.85
Emission Estimates	.16	.19	.20
Reports, legislation	.19	.28	.31
Data Acquisition	(1.06)	(1.52)	(1.70)
Monitoring Network	.20	.29	.33
Source Testing	.10	.14	.16
Special Studies	.19	.28	.31
Instrument Maint.	.10	.14	.16
Laboratory Operations	.18	.25	.28
Data Processing	.29	.42	.46
Management Services	(2.96)	(3.63)	(3.90)
Policy, P/R etc.	.70	.92	1.00
Staff Training	.38	.39	.40
Admin. and Clerical Support	1.88	2.32	2.50
Totals	7.5	10	12

Table 10.2

Control Agency Functions

Fund estimates by function for Vermont AQCR 159 and 221.

Function	Present	1973	1975
Enforcement Services			
Operating Funds	47,825	67,900	92,000
Capital Funds	0	0	0
Contract Funds	------	-----	------
Engineering Services			
Operating Funds	19,429	25,000	28,000
Capital Funds	0	0	------
Contract Funds	4,000	4,000	2,000
Data Acquisition			
Operating Funds	20,924	30,000	33,000
Capital Funds	40,345	15,000	6,000
Contract Funds	------	------	5,000
Management Services			
Operating Funds	61,277	75,100	81,000
Capital Funds	1,000	1,000	1,000
Contract Funds	3,000	3,000	5,000
Total Operating Funds	149,455	198,000	218,000
Total Capital Funds	41,345	15,000	7,000
Total Contract Funds	7,000	7,000	12,000
Total Funds	197,825	220,000	253,000

11.0 INTERGOVERNMENTAL COOPERATION

11.1 Interstate

Region 159 has a joint region in the Lake Champlain Valley which encompasses seven counties in New York State. It is necessary that New York and Vermont cooperate in enforcing similar rules and regulations within this geographically similar area. These arrangements are conducted at the level of the Director of each State agency responsible for air pollution control.

In the June 8, 1967 report "Status of Air Pollution Control Program" to the New England Governors' Conference, the New England Conference of State Public Health Officials recommended establishment of a conference group of air pollution control personnel from each state to discuss problems, exchange experiences, and develop regional air pollution control programs. The Governors' Conference accepted the recommendation and authorized the Conference of State Public Health Officials to establish a temporary coordinating body to study these problems. Following a meeting of the Conference in August 1967, the Commissioners designated members of their staffs to undertake this work and the group became known as the New England Staff for Coordinated Air Use Management (NESCAUM). New York State representatives were invited to participate. Also, Regional staff of the Environmental Protection Agency attend meetings and participate in program development.

NESCAUM had and has several major objectives. First, that uniform air quality evaluation techniques including air sampling, analysis, and reporting of data be studied and developed. Second, that there be a region-wide interchange of data on air quality among the staff members and appropriate agencies within each state. Third, that there be close cooperation between the states in determining and identifying actual and potential multi-state air pollution problems. Fourth, that there be serious and objective study on such matters as interstate compacts and legislation.

The New England Council was designated as Secretariat at the initial meeting. The Secretary prepares meeting agenda, news releases, research reports, distributes news articles, federal legislative digests, and other material of interest, and also maintains liaison with the New England Conference of State Public Health Officials and other federal and state agencies.

One of the major objectives of NESCAUM is to review the need for and the impact of legislation dealing with air pollution control. This also includes the study of the use of interstate compacts to effect multi-state air pollution control. NESCAUM called a briefing session with the staff of the then National Center for Air Pollution Control in February, 1968, to discuss the provisions of the Air Quality Act of 1967 and its impact on New England. The Conference of State Public Health Officials, who studied the need for a regional compact, after reviewing the NESCAUM report, presented the following conclusions to the Governors' Conference:

1. There is strong region-wide area of interest in the New England states with respect to the need to develop workable solutions to air pollution control problems.

2. There are no recognized interstate problems that involve more than two New England states at any one time. There is no present need for a muulti-state compact among the New England states.

3. It may be necessary that bilateral arrangements between some of the states be made for a combined attack on a common problem.

Based on these conclusions, the Conference of State Public Health

Officials then recommended that the Conference should continue to provide a vehicle for regional cooperation and professional assistance. NESCAUM should continue to study regional problems and, working through the Conference, provide the machinery to solve existing and developing air pollution problems which may require interstate cooperation.

Since that time, the State air pollution control administrators have met on a regular basis to discuss their mutual problems, and thus allowing an interstate exchange of information.

11.2 Intrastate

Cooperation with the various other agencies within the State is necessary to fully implement a comprehensive air pollution control effort. The cooperation could be classified as either direct assistance in recording or enforcing the air pollution control regulation, or as a technical input regarding possible air pollution potential during pre-construction review of plans.

Significant assistance is obtained through the framework of State government during the enforcement of the regulations. This ancillary assistance is exhibited by the attached directives from other agencies to their subordinates to consider air pollution in their routine duties (Figures 11.1 and 11.2). Health Department sanitarians whose responsibilities include the inspection of restaurants and motels can be used to check violations of the air pollution control regulations at these establishments (4000) during their routine inspections. Under the fire protection laws of the State, a person must obtain a burning permit from the local fire warden (150) if the ground is not covered with snow. The fire wardens have taken into account the air pollution control regulations before issuance of a

AGENCY OF HUMAN SERVICES
DEPARTMENT OF HEALTH
BURLINGTON, VERMONT

TO: All licensed food and lodging establishments.

FROM: Vermont Department of Health, Division of Environmental Health
115 Colchester Ave., Burlington, Vermont (Tel: 862-5701 ext. 31)
H. E. Sargent, Director

SUBJECT: Prohibition of open or unauthorized burning of solid wastes from restaurants or lodging facilities.

DATE: September 1, 1971

"THE BURNING MUST STOP"

Air pollution control regulations effective April 1, 1970 and revised August 10, 1971 prohibit burning of combustible material except in an acceptable multiple chamber incinerator, the design of which has been approved by the Air Pollution Section of the Industrial Hygiene Division. These approvable incinerators cost in the thousands of dollars and possibly for that reason their installation may not be feasible.

Accordingly, please be advised that all burning in connection with refuse from your licensed establishment or any other solid waste produced by your commercial facilities, is prohibited (except when done in accordance with approved plans by the Division of Industrial Hygiene). Our sanitarians will immediately be checking your licensed places to insure that outside burning, such as in a 55 gallon oil drum or other unapproved means, is not occurring.

We seek your pleasant cooperation in this effort by the Board of Health to reduce smoke emissions to the atmosphere, which we feel will help result in a healthier state in which to live.

A copy of the regulations may be inspected at your town or city clerk's office, by contacting your local health officer, by writing this division for a copy, or by contacting the Division of Industrial Hygiene, Box 607, 32 Spaulding St., Barre, Vt. Telephone: 476-3171.

RENOVATIONS: - - - - - - - - -

You are reminded, concerning new buildings or additions and modifications to your licensed places, that plans and specifications developed by a registered engineer or registered architect must be submitted in advance to the Division of Protection, Agency of Environmental Conservation, Montpelier, Vt. However, regarding small face liftings or minor changes, not involving major sewage disposal, water supply, plumbing, or kitchen redesign, you should contact the District Sanitarian or this office. There may also be local requirements of your municipality.

cc: Division of Industrial Hygiene
Division of Protection
Local Health Officer
Town Clerk
Sanitarians

VAPONA STRIPS ARE NOT
PERMITTED WHERE FOOD
IS SERVED OR PREPARED

Figure 11.1

DEPARTMENT OF FORESTS AND PARKS
MONTPELIER, VERMONT 05602

MEMORANDUM: Forest Fire Wardens

FROM: Nathan Dauchy, Chief of Forest Fire Control

SUBJECT: Brush burning laws and Air Pollution

DATE: March 31, 1971

The Brush Burning Law (10 V S A 1496) has not been changed but under Air Pollution Regulations certain types of open burning have been forbidden.

We would like your cooperation in helping to reduce air pollution by using the following guide lines when issuing brush burning permits. Your judgement, however, is always the deciding factor in granting or refusing a burning permit, subject to the laws.

It is forbidden to use tires, asphalt shingles or other materials producing dense black smoke to ignite fires.

No permits should be issued for:
(1) Burning at dumps or in segregated areas connected with dumps.
(2) Burning old cars or car parts.
(3) Burning industrial waste. (Slabs, bark & sawdust are industrial waste.)

Unless the person wishing to do the burning has written permission from Harry Ashe of the Industrial Hygiene Division

Permits may be issued for "on premise" burning except as noted above. "On premise" burning means burning at the place the debris originated, by a person with a legal right to be occupying the premises. (Owner, agent, leasee, right-of-way holder, etc.)

Permits may be issued for fire chiefs to do burning for training purposes. Burning for training purposes can be done without permission from Mr. Ashe

ND/mb

Figure 11.2

burning permit.

Both the State Police and the Department of Motor Vehicles have assured the Division their full cooperation in the enforcement of regulations that would apply to motor vehicles. The State Attorney's Office, the prosecuting arm of the State in criminal matters, has pledged full cooperation in the enforcement of environmental control regulations through its State Association, while the Office of Attorney General has indicated that this office will assist the agency in civil actions.

Various agencies within the State have the jurisdiction for the pre-construction review and approval of plans. These jurisdictions need not necessarily be exclusive. In matters relating to a potential air pollution emission, the various components of State government would utilize the air pollution control staff as their technical consultant in this area. Such agencies would include:

1.) State Board of Health
2.) State Health Department, Medical Care Division - responsible for review of construction of hospitals under Hill Burton funding. This Division has especially utilized the staff in the review of incinerators for installation in hospitals and nursing homes.
3.) Public Service Board - new sources of electrical generations.
4.) District Environmental Commissions, and the State Environmental Board - any application under 250 that could cause an air pollutant emission.

12.0 RULES AND REGULATIONS

Emissions limitations and other measures necessary for attainment and maintenance of national standards of air quality have been established by the State Department of Health of Vermont. These rules and regulations are attached as Appendix B to this report. The enabling legislation is attached as Appendix A to this report. These rules and regulations now in effect, provide that Vermont will meet Secondary Standards set forth by the Environmental Protection Agency not later than January 1, 1975.

APPENDIX A

AIR POLLUTION CONTROL
Title 10 Vermont Statutes Annotated
Chapter 15 Nos. 351-370

AIR POLLUTION CONTROL
Title 10 Vermont Statutes Annotated
Chapter 15 Nos. 351-370

Sec. 351. Declaration of policy and purpose

(a) It is hereby declared to be the public policy of this state and the purpose of this chapter to achieve and maintain such levels of air quality as will protect human health and safety, and to the greatest degree practicable, prevent injury to plant and animal life and property, foster the comfort and convenience of the people, promote the economic and social development of this state and facilitate the enjoyment of the natural attractions of this state.

(b) It is also declared that local and regional air pollution control programs are to be supported to the extent practicable as essential instruments for the securing and maintenance of appropriate levels of air quality.

(c) To these ends it is the purpose of this chapter to provide for a coordinated statewide program of air pollution prevention, abatement and control, for an appropriate distribution of responsibilities among the state and local units of government, and to facilitate cooperation across jurisdictional lines in dealing with problems of air pollution not confined within single jurisdictions, and to provide a framework within which all values may be balanced in the public interest.

Sec. 352. Definitions

As used in this chapter:

(1) "Air contaminant" means dust, fumes, mist, smoke, other particulate matter, vapor, gas odorous substances, or any combination thereof.

(2) "Air pollution" means the presence in the outdoor atmosphere of one or more contaminants in such quantities and duration as is or tends to be injurious to human health or welfare, animal or plant life, or property, or would unreasonably interfere with the enjoyment of life or property; in accordance with the establishment of ambient air quality standards for the state as a whole or any part thereof, based on nationally recognized criteria applicable to the State of Vermont.

(3) "Emission" means a release into the outdoor atmosphere of air contaminants.

(4) "Person" means any individual, or group of individuals organized for fraternal or any other purpose, partnership, firm, association, municipality, public or private corporation, state agency or subdivision of the state, or any other legal entity.

Sec. 353. Agency

The State Board of Health is hereby designated as the air pollution control agency hereinafter referred to as the agency. The Commissioner of Health shall designate the Director of Industrial Hygiene as director of the division who shall perform the functions vested in the agency.

Sec. 354. Powers

In addition to any other powers conferred on it by law the State Board of Health shall have power to:

(1) Appoint and employ personnel and consultants as may be necessary for the administration of this chapter.

(2) Adopt, amend and repeal rules, implementing the provisions of this chapter.

(3) Hold hearings related to any aspect of or matter in the administration of this chapter, and in connection therewith, subpoena witnesses and the production of evidence.

(4) Issue orders as may be necessary to effectuate the purposes of this chapter and enforce the same by all appropriate administrative and judicial proceedings.

(5) Prepare and develop a comprehensive plan or plans for the prevention, abatement and control of air pollution in this state.

(6) Encourage voluntary cooperation by persons and affected groups to achieve the purposes of this chapter.

(7) Encourage local units of government to handle air pollution problems within their respective jurisdiction, and by compact on a cooperative basis, and to provide technical and consultative assistance therefor.

(8) Encourage and conduct studies, investigations and research relating to air contamination and air pollution and their causes, effects, prevention, abatement and control.

(9) Determine by appropriate means the degree of air contamination and air pollution in the state and the several parts thereof.

(10) Make a continuing study of the effects of the emission of air contaminants from motor vehicles on the quality of the outdoor atmosphere of this state and the several parts thereof, and make recommendations to appropriate public and private bodies with respect thereto.

(11) Establish ambient air quality standards for the state as a whole or for any part thereof, based on nationally recognized criteria applicable to the State of Vermont.

(12) Collect and disseminate information and conduct educational and training programs relating to air contamination and air pollution.

(13) Advise, consult, contract and cooperate with other agencies of the state, local governments, industries, other states, interstate or interlocal agencies, and the federal government, and with interested persons or groups.

(14) Consult, upon request, with any person proposing to construct, install, or otherwise acquire an air contaminant source or device or system for the control thereof, concerning the efficacy of the device or system, or the air pollution problem which may be related to the source, device or system. Nothing in any consultation shall be construed to relieve a person from compliance with this chapter, rules in force pursuant thereto, or any other provision of law.

(15) Accept, receive and administer grants or other funds or gifts from public and private agencies, including the federal government, for the purpose of carrying out any of the functions of this chapter. The funds received by the State Board of Health pursuant to this section shall be deposited in the state treasury to the account of the State Board of Health.

(16) Have access to records relating to emissions which cause or contribute to air contamination.

Sec. 355. Classification and reporting

(a) The State Board of Health, by rule, may classify air contaminant sources, which in its judgment may cause or contribute to air pollution, according to levels and types of emissions and other characteristics which relate to air pollution, and may require reporting by any class. Classifications made pursuant to this subsection may apply to the state as a whole or to any designated area of the state, and shall be made with special reference to effects on health, economic and social factors, and physical effects on property.

(b) Any person operating or responsible for the operation of air contaminant sources of any class for which the rules of the State Board of Health require reporting shall make reports containing information as required by the State Board of Health concerning location, size and height of contaminant outlets, processes employed, fuels used and the nature and time periods of duration of emissions, and such other information relevant to air pollution and available or reasonably capable of being assembled.

Sec. 356. Additional contaminant control measures

(a) The State Board of Health may require that notice be given to it prior to the undertaking of the construction or installation of particular types or classes of new air contaminant sources specified in its rules and regulations. Within fifteen days of its receipt of the notice, the State Board of Health may require, as a condition precedent to the construction or installation or establishment of the air pollution source or sources covered thereby, the submission of plans, specifications, and other information as it deems necessary in order to determine whether the proposed construction or installation will be in accord with applicable rules in force pursuant to this chapter. Within thirty days of the receipt of plans, specifications or other information required pursuant to this section the State Board of Health shall determine if the proposed construction or installation is in accord with the requirements of this chapter or applicable rules and shall issue an order approving or prohibiting the construction or installation or establishment of the air contaminant source or sources, or give approval upon fulfillment of specified conditions. Failure of such an order to issue within the time prescribed herein shall be deemed a determination that the construction, installation or establishment may proceed provided that it is in accordance with the plans, specifications or other information, if any, required to be submitted.

(b) In addition to other remedies available on account of the issuance of an order prohibiting construction or installation and prior to invoking any remedies, the person or persons aggrieved thereby shall, upon request in accordance with rules of the State Board of Health, be entitled to a hearing on the order. Following such hearing, the order may be affirmed, modified or withdrawn.

(c) For the purposes of this chapter, addition to or enlargement or replacement of an air contaminant source, or any major alteration therein, shall be construed as construction or installation of a new air contaminant source.

(d) All facilities or parts thereof called for by plans, specifications or other information submitted pursuant to subsection (a) of this section shall be maintained in good working order.

(e) Nothing in this section shall be construed to authorize the State Board of Health to require the use of a facility available only from a particular supplier or produced by a particular manufacturer.

(f) The absence or failure to issue a rule or order pursuant to this section shall not relieve any person from compliance with any emission control requirements or with any other provision of law.

Sec. 357. Inspections

Any duly authorized officer, employee, or representative of the State Board of Health may enter and inspect any property, premise or place on or at which an air contaminant source is located or is being constructed or installed at any reasonable time for the purpose of ascertaining the state of compliance with this chapter and rules in force pursuant thereto. No authorized person shall refuse entry or access to any authorized representative of the State Board of Health who requests entry for purposes of inspection, and who presents appropriate credentials; nor shall any person obstruct, hamper or interfere with the inspection. If requested, the owner or operator of the premises shall receive a report setting forth all facts found which relate to compliance status.

Sec. 358. Emission control requirements

The State Board of Health may establish such emission control requirements, by rule, as in its judgment may be necessary to prevent, abate, or control air pollution. The requirements may be for the state as a whole or may vary from area to area, as may be appropriate to facilitate accomplishment of the purposes of this chapter, and in order to take necessary or desirable account of varying local conditions.

Sec. 359. Enforcement

(a) Whenever the State Board of Health has reason to believe that a violation of any provision of this chapter or rule pursuant thereto has occurred, it may cause written notice to be served upon the alleged violator or violators. The notice shall specify the provision of this chapter or rule alleged to be violated, and the facts alleged to constitute a violation thereof, and may include an order that necessary corrective action be taken within a reasonable time. The order shall become final unless, no later than thirty days after the date the notice and order are served, the person or persons named therein request in writing a hearing before the State Board of Health. Upon receipt of the request, The State Board of Health shall hold a hearing. In lieu of an order, the State Board of Health may require that the alleged violator or violators appear before the State Board of Health for a hearing at a time and place specified in the notice and answer the charges complained of, or the State Board of Health may initiate action pursuant to section 367 of this title.

(b) If, after a hearing held pursuant to subsection(a) of this section, the State Board of Health finds that a violation or violations have occurred, it shall affirm or modify its order previously issued, or issue an appropriate order or orders for the prevention, abatement or control of the emissions involved or for the taking of such other corrective action as may be appropriate. If, after hearing on an order contained in a notice the State Board of Health finds that no violation is occurring, it shall rescind the order. Any order issued as part of a notice or after hearing may prescribe a time schedule for necessary action in preventing, abating or controlling the emissions.

(c) Nothing in this chapter shall prevent the State Board of Health from making efforts to obtain voluntary compliance through warning, conference or any other appropriate means.

(d) In connection with any hearing held pursuant to this section, the State Board of Health shall have power and upon application by any party it shall have the duty to subpoena witnesses and the production of evidence on behalf of all parties.

Sec. 360. Emergency procedure

(a) Any other provisions of law to the contrary notwithstanding, if the State Board of Health finds that a generalized condition of air pollution exists and that it creates an emergency requiring immediate action to protect human health or safety, with the concurrence of the Governor, the State Board of Health shall order persons causing or contributing to the air pollution to reduce or discontinue immediately the emission of air contaminants and such order shall fix a place and time not later than twenty-four hours thereafter for a hearing to be held before the director. Not more than twenty-four hours after the commencement of such hearing and without adjournment thereof, the director shall affirm, modify or set aside the order.

(b) In the absence of a generalized condition of air pollution of the type referred to in subsection (a) of this section, if the State Board of Health finds that emissions from the operation of one or more air contaminant sources is causing imminent danger to human health or safety, the Director of Industrial Hygiene may order the person or persons responsible for the operation or operations in question to reduce or discontinue emissions immediately, without regard to the provisions of section 359 of this title. In that event, the requirements for hearing and affirmance, modification or setting aside of orders set forth in subsections 359 (a) and 359 (b) shall apply.

(c) Nothing in this section shall be construed to limit any power which the Governor or any other officer may have to declare an emergency and act on the basis of such declaration.

Sec. 361. Variances

(a) A person who owns or is in control of any plant, building, structure, process or equipment may apply to the State Board of Health for a variance from its rules. The State Board of Health may grant a variance if it finds that:

(1) The emissions occurring or proposed to occur do not endanger or tend to endanger human health or safety; and

(2) Compliance with the rules from which variance is sought would produce serious hardship without equal or greater benefits to the public.

(b) No variance shall be granted pursuant to this section except after public hearing on due notice and until the State Board of Health has considered the relative interests of the applicant, other owners of property likely to be affected by the discharges, and the general public.

(c) Any variance or renewal thereof shall be granted within the requirements of subsection (a) of this section and for time periods and under conditions consistent with the reasons therefor, and within the following limitations:

(1) If the variance is granted on the ground that there is no practicable means known or available for the adequate prevention, abatement or control of the air pollution involved, it shall be only until the necessary practicable means for prevention, abatement or control become known and available, and subject to the taking of any substitute or alternate measures that the State Board of Health may prescribe.

(2) If the variance is granted on the ground that compliance with the particular requirement or requirements from which variance is sought will necessitate the taking of measures which, because of their extent or cost, must be spread over a considerable period of time, it shall be for a period not to exceed such reasonable time as, in the view of the State Board of Health is requisite for the taking of the necessary measures. A variance granted on the ground specified herein shall contain a time schedule for the taking of action in an expeditious manner and shall be conditioned on adherence to the time schedule.

(3) If the variance is granted on the ground that it is justified to relieve or prevent hardship of a kind other than that provided for in items 1 and 2 of this subparagraph, it shall be for not more than one year.

(d) Any variance granted pursuant to this section may be renewed on terms and conditions and for periods which would be appropriate on initial granting of a variance. If complaint is made to the State Board of Health on account of the variance, no renewal thereof shall be granted, unless following public hearing on the complaint on due notice, the State Board of Health finds that renewal is justified. No renewal shall be granted except on application therefor. The application shall be made at least sixty days prior to the expiration of the variance. Immediately upon receipt of an application for renewal the State Board of Health shall give public notice of the application in accordance with rules of the State Board of Health.

(e) A variance or renewal shall not be a right of the applicant or holder thereof but shall be in the discretion of the State Board of Health. However, any person adversely affected by a variance or renewal granted by the State Board of Health may obtain judicial review thereof by a proceeding in the appropriate court.

(f) Nothing in this section and no variance or renewal granted pursuant hereto shall be construed to prevent or limit the application of the emergency provisions and procedures of section 360 of this chapter to any person or his property.

Sec. 362. Hearings and judicial review

(a) No rule or regulation and no amendment or repeal thereof shall take effect except after public hearing. The State Board of Health shall appoint a time and place for the hearing and shall order the publication of the substance thereof and of the time and place of hearing two weeks successively in the daily newspapers of the state, the last publication to be at least seven days before the day appointed for the hearing.

(b) Nothing in this section shall be construed to require a hearing before issuance of an emergency order pursuant to section 360 of this chapter.

(c) Any person aggrieved by any order of the State Board of Health may have judicial review thereof by appeal under Section 2382 of title 12 within thirty days of the date of the order.

Sec. 363. Confidential records; penalty

(a) Confidential records. Any records or other information furnished to or obtained by the State Board of Health concerning one or more air contaminant sources, which records or information, as certified by the owner or operator, relate to production or sales figures or to processes or production unique to the owner or operator of which would tend to affect adversely the competitive position of the owner or operator, shall be only for the confidential use of the State Board of Health in the administration of this chapter, unless the owner or operator shall expressly agree to their publication or availability to the general public. Nothing herein shall be construed to prevent the use of the records or information by the State Board of Health in compiling or publishing analyses of summaries relating to the general condition of the outdoor atmosphere: provided that the analyses or summaries do not identify any owner or operator or reveal any information otherwise confidential under this section.

(b) Penalty. A person who knowingly violates this section shall be fined not to exceed $100.00.

Sec. 364. Local air pollution control programs

(a) A municipality may establish and thereafter administer within its jurisdiction an air pollution control program which:

(1) Provides by ordinance or local law for requirements compatible with, or stricter or more extensive than those imposed by sections 358, 360 and 361 of this chapter and regulations issued thereunder;

(2) Provides for the enforcement of such requirements by appropriate administrative and judicial process;

(3) Provides for administrative organizations, staff, financial, and other resources necessary to effectively and efficiently carry out its program; and

(4) Is approved by the State Board of Health as adequate to meet the requirements of this chapter and any applicable rules and regulations pursuant thereto.

(b) A municipality may administer all or part of its air pollution control program in a compact if the program meets the requirements of subsection (a) of this section.

(c) If an approved local air pollution authority so petitions and the State Board of Health finds that the control of a particular class of air contaminant source because of its complexity or magnitude is beyond the reasonable capability of the local air pollution control authorities or may be more efficiently and economically performed at the state level, it may assume and retain jurisdiction over that class of air contaminant source. Classifications pursuant to this paragraph may be either on the basis of the nature of the sources involved or on the basis of their relationship to the size of the communities in which they are located.

(d) Nothing in this chapter shall be construed to supersede or oust the jurisdiction of any local air pollution control program in operation on July 1, 1968; provided that within two years from such date any such program shall meet all requirements of this chapter for a local air pollution control program. Any approval required from the State Board of Health shall be deemed granted unless the State Board of Health takes specific action to the contrary.

Sec. 365. State and federal aid

Local air pollution control agencies established or approved pursuant to this chapter may make application for, receive, administer and expend federal funds for the control of air pollution or the development and administration of programs related to air pollution control, provided the application is first submitted to and approved by the State Board of Health. The State Board of Health shall approve the application if it is consistent with this chapter and any other applicable requirements of law.

Sec. 366. Motor vehicle pollution

(a) The State Board of Health in conjunction with the motor vehicle department may provide rules for the control of emissions from motor vehicles. Such rules may prescribe requirements for the installation and use of equipment designed to reduce or eliminate emissions and for the proper maintenance of the equipment and the vehicles. Rules pursuant to this section shall be consistent with provisions of federal law, if any, relating to control of emissions from the vehicles concerned and shall not require, as a condition precedent to the initial sale of a vehicle or vehicular equipment, the inspection, certification or other approval of any feature or equipment designed for the control of emissions from motor vehicles, if the feature or equipment has been certified, approved, or otherwise authorized pursuant to federal law.

(b) Except as permitted or authorized by law, no person shall fail to maintain in good working order or remove, dismantle or otherwise cause to be inoperative any equipment or feature constituting an operational element of the air pollution control system or mechanism of a motor vehicle and required by rules pursuant to this chapter to be maintained in or on the vehicle. Any failure to maintain in good working order or removal, dismantling or causing of inoperability shall subject the owner or operator to suspension or cancellation of the registration for the vehicle by the motor vehicle department. The vehicle shall not thereafter be eligible for registration until all parts and equipment constituting operational elements of the motor vehicle have been restored, replaced or repaired and are in good working order.

(c) The State Board of Health shall consult with the motor vehicle department and furnish it with technical information, including testing techniques, standards and instructions for emission control features and equipment.

(d) When rules have been issued requiring the maintenance of features or equipment in or on motor vehicles for the purpose of controlling emissions therefrom, no motor vehicle shall be issued an inspection sticker unless all the required features or equipment have been inspected in accordance with the standards, testing techniques and instructions furnished pursuant to subsection(b) hereof and has been found to meet those standards.

(e) The remedies and penalties provided her apply to violations of section 366 and provision of section 367 of this title shall not apply.

(f) As used in this section "motor vehicle" shall have the same meaning as defined in section 4 of title 23.

Sec. 367. Penalties

Any person who violates a provision of this chapter, except sections 353 and 356 or any rule shall be fined not to exceed $2,000.00.

In the event such violation is of any of the terms and conditions of an order of the State Board of Health issued under section 359 of this chapter, the expiration of each 30-day period after the expiration of the reasonable time specified in that order during which corrective action must be taken shall constitute a separate violation under this section. In the event such violation is of any of the terms and conditions of an order of the State Board of Health issued under section 360 of this title, the expiration of each five-day period after the effective date of that order shall constitute a separate violation under this section.

Sec. 368. Limitations

Nothing in this chapter shall be construed to:

(a) Affect the relations between employers and employees with respect to or arising out of any condition of air contamination or air pollution.

(b) Supersede or limit the applicability of any law or ordinance relating to sanitation, industrial health or safety.

(c) Grant to the director any jurisdiction or authority with respect to air contamination existing solely within commercial and industrial plants, works or shops or private property appurtenant thereto.

Sec. 369. Exemption from taxation

Approved air pollution treatment facilities shall be exempted from real and personal property taxation in the same manner provided tax exemption of water treatment facilities under the provisions of section 3802 of title 32.

Sec. 370. Construction with other laws

When a person as defined in section 352, subsection 4, is required to abate a source of air pollution existing at the date of passage of this chapter and to concurrently abate a source of water pollution in accord with any existing Vermont water resources board's classification order document issued pursuant to sections 902-908 of title 10, water pollution control, the State Board of Health, the Vermont water resources board and the person or their designated representatives shall meet and establish a properly coordinated program for the abatement of air and water pollution sources concurrently or in sequence. Such program shall specify a reasonable time within which facilities for abatement shall be in use, having regard for the rights and interests of the general public, and reasonableness and equity of the cost of installation of the pollution abatement devices. New sources of air pollution notwithstanding are subject to abatement.

Effective July 1, 1968

Industrial Hygiene Division
Vt. State Department of Health
32 Spaulding St. (P.O. Box 607)
Barre, Vermont 05641

APPENDIX B

STATE DEPARTMENT OF HEALTH

Industrial Hygiene Division
32 Spaulding Street
Barre, Vermont 05641

VERMONT HEALTH REGULATIONS PART 5
Chapter 4
AIR POLLUTION

REGULATIONS EFFECTIVE AS OF AUGUST 10, 1971

EFFECTIVE DATES OF AIR POLLUTION CONTROL REGULATIONS

Subchapter I. (April 1, 1970)
Subchapter II. (April 1, 1970, revised August 10, 1971)
Subchapter III. (April 1, 1970, revised June 23, 1971)
Subchapter IV. (February 1, 1971)
Subchapter V. (February 1, 1971)
Subchapter VI. (June 23, 1971)
    Additions to Subchapter IV, Section 5-462 (b), (c), (d), Sections 5-463, 5-464, (August 10, 1971)
Subchapter VII. (June 23, 1971)
Subchapter VIII. (June 23, 1971) Section 5-484 (August 10, 1971)
Subchapter IX. (June 23, 1971)
Subchapter X. (August 10, 1971)

STATE DEPARTMENT OF HEALTH
Industrial Hygiene Division
32 Spaulding Street
Barre, Vermont

VERMONT HEALTH REGULATIONS PART 5
Chapter 4
AIR POLLUTION

SUBCHAPTER I. REPORTING OF AIR CONTAMINANTS AND CLASSIFICATION OF AIR CONTAMINANT SOURCES.

5-411 INDUSTRIES CLASSIFIED

The following activities are hereby classified as air contaminant sources if they do or may result in the discharge or emission of solid, liquid or gaseous wastes into the atmosphere.

a. Petroleum and petro-chemical development, processing and marketing;
b. Industrial chemical manufacturing and processing;
c. Paints and related materials, manufacturing and handling and application;
d. Plastic, rubber and resin processing,
e. Metal melting and reclaiming;
f. Metal fabricating;
g. Surface finishing and coating;
h. Mineral, development and processing, including mining and quarrying and product application, including refuse;
i. Woodworking, furniture manufacturing, sawmills, including refuse;
j. Food processing;
k. Inedible animal and vegetable byproduct processing;
l. Commercial, indusrrial, recreational, lodging, public and other buildings,
m. Commercial activities;
n. Governmental activities;
o. Vehicle manufacturing and servicing facilities;
p. Textile, fabric, fiber, monofilament manufacturing and processing;
q. Public utilities.

5-412 WRITTEN REPORTS WHEN REQUESTED

The Director of Industrial Hygiene may require written reports from the person operating or responsible for any air contaminant source, which reports shall include the location, size and height of contaminant outlets, processes employed, fuels used, nature and time periods of duration of emissions and such other information relevant to air pollution and available or reasonably capable of being assembled as determined necessary and requested by said Director.

SUBCHAPTER II. PROHIBITION OF OPEN BURNING.

5-421 PURPOSE

In accordance with 10 V.S.A. Chapter 15, this regulation is adopted for the purpose of preventing, abating, and controlling air pollution caused by air contaminants discharged into the air by open burning of combustibles.

5-422 DEFINITIONS

For the purpose of this subtitle, the following words and phrases have these meanings:

a. Person: Means any individual, or group of individuals organized for fraternal or any other purpose, partnership, firm, association, municipality, public or private corporation, state agency or subdivision of the state, or any other legal entity.

b. Combustion products: Particulate and gaseous contaminants created by the burning of any kind of material.

c. Open burning: The burning of any type of combustible material in the open where the products of combustion are emitted directly into the atmosphere without passing through a stack, chimney, or other enclosure. Burning shall include ignition, permitting or causing ignition and suffering, allowing or maintaining burning.

d. Refuse (garbage, rubbish and trade wastes).

d.1. Garbage: Waste resulting from distribution, preparation and serving of food.

d.2. Rubbish: Solids or liquids not considered to be highly flammable or explosive, such as, but not limited to, paper, rags, ashes, leaves, tree branches, yard trimmings, furniture, tin cans, glass, crockery, demolition wastes, junk automobiles, tires, automotive parts, paints, oils, and other similar materials.

d.3. Trade waste: Combustible solid or liquid material resulting from construction, building operations, or the prosecution of any business, trade or industry, such as, but not limited to, plastic, rubber, leather, chemicals, cartons, paints, greases, oils, other petroleum products, sawdust, dead animals (including fish and fowl), and other forms of solid or liquid waste materials.

e. Agency: State Board of Health.

f. Director: Director, Industrial Hygiene Division.

g. Forest Land Area is at least 25 acres of land that is at least 10% stocked with trees of any size.

5-423 OPEN BURNING PROHIBITED

No person shall engage in open burning of refuse except in conformity with the provisions of Section 5-424.

5-424 PERMISSIBLE OPEN BURNING

When not prohibited by local ordinances or officials having jurisdictio such as local, state or federal fire wardens or other fire prevention officials, the following types of burning are permissible, provided no public or private nuisance is created.

a. Fires in conjunction with holiday and festive celebrations.

b. Campfires, outdoor grills, and fireplaces for recreation or preparing of food.

c. Burning of solid or liquid fuels or structures for the purpose of bona fide instruction and training of municipal, volunteer, and industrial firefighters in the methods of fighting fires when conducted under the direct control and supervision of qualified instructors. Said firefighters shall be residents of the State of Vermont or affiliated with the mutual aid systems within the State of Vermont.

d. Burning in forest land areas of brush, tree cuttings and slash wher the cuttings accrue from pulping, lumber, and clearing of initial rights of way. Open burning related to clearing of initial rights of way in forest land areas will be considered permissible until September 1, 1973. (Tires, asphalt material or other material that could cause dense black smoke shall not be used to ignite the brush or tree cuttings.)

e. On premise burning for the purpose of weed abatement; disease, forest fire and pest prevention; and agricultural improvement.

f. On premise burning of leaves, brush, deadwood, tree cuttings accrue from normal property maintenance by the owner, or lessee thereof.

g. Backyard burning of combustible domestic rubbish, except garbage, where no public disposal is available. This provision applies only to on-premises burning of combustible material, except garbage, in a backyard waste burner having a capacity of eight (8) cubic feet or less and serving a building containing four (4) or less dwelling units.

h. Open burning in remote areas, as follows, if prior approval in writing is obtained from the Director.

   1. Highly explosive or other dangerous, or unusual materials for which there is no other feasible method of disposal.

   2. Burning of combustible construction material resulting from the demolition of buildings and other structures, brush, tree trunks and the like, originating from within the state.

   3. Other combustible materials for which there is no other feasible method of disposal.

5-425 EXCEPTIONS

a. Open burning incidental to the development and testing of open pit incinerators provided plans and location meet the approval of the State Board of Health and further provided that the State Board of Health reserves the right to approve or disapprove the final design based on acceptable performance tests.

5-426 EXEMPTION FROM LIABILITY

A permission granted by the Director under the provisions of this regulation does not relieve the petitioner from any legal responsibility attributable to the burning authorized by the permit.

SUBCHAPTER III. PROHIBITION OF VISIBLE AIR CONTAMINANTS.

5-431 DEFINITION

Ringelmann Chart. The chart published and described in U. S. Bureau of Mines Information Circular 8333 (May, 1967), and on which are illustrated graduated shades of grey for use in estimating the light obscuring capacity of smoke.

5-432 INSTALLATIONS CONSTRUCTED PRIOR TO APRIL 30, 1970

On or after January 1, 1971 no person shall cause, suffer, allow or permit the emission of any air contaminant for more than a period or periods aggregating six (6) minutes in any hour, which has:

a. A shade, or density, greater than No. 2 of the Ringelmann Chart.

b. A shade or density of such opacity as to obscure an observer's view to a degree greater than does smoke described in subsection (a) of this section.

At no time shall the visible air contaminants have a shade, density, or appearance greater than No. 3 of the Ringelmann Chart.

The January 1, 1971 requirement will be presumed to have been met if an abatement schedule is submitted and approved by the Director before January 1, 1971, provided that the person installs the equipment necessary for full compliance with the regulations no later than January 1, 1972.

5-433 INSTALLATIONS CONSTRUCTED SUBSEQUENT TO APRIL 30, 1970

On or after April 30, 1970 no person shall cause, suffer, allow or permit the emission of any visible air contaminant, from installations constructed after the effective date of these regulations for more than a period or periods aggregating six (6) minutes in any hour, which has:

a. A shade, or density, greater than No. 1 of the Ringelmann Chart.

b. A shade, or density, of such opacity as to obscure an observer's view to a degree greater than does the smoke described in subsection (a) of this section.

At no time shall the visible air contaminant have a shade, density, or appearance greater than No. 3 of the Ringelmann Chart.

SUBCHAPTER IV. PROHIBITION OF POLLUTION POTENTIAL MATERIALS IN FUELS.

5-441 DEFINITIONS

Fuel. Any form of combustible matter - solid, liquid or gas, excluding combustible refuse.

Sulfur compounds. All organic or inorganic chemicals having an atom or atoms of sulfur in their chemical structure.

5-442 SULFUR LIMITATION IN FUEL

a. No person shall cause or permit the use, purchase, or sale for use in stationary combustion installations within the State of Vermont for heat or power generation, fuels containing more sulfur, percentage by weight, than that specified in the table below:

By October 1, 1971, not more than 2.2% sulfur by weight.

By October 1, 1972, not more than 1.5% sulfur by weight.

By October 1, 1974, not more than 1.0% sulfur by weight.

b. This provision of these regulations shall not apply where sulfur compounds are removed from the stack gases to the extent that the emission of sulfur compounds to the atmosphere is no greater than that which would be emitted under subsection (a) of this regulation.

SUBCHAPTER V. MOTOR VEHICLE EMISSIONS

5-451 DEFINITIONS

5-452 REMOVAL OF CONTROL DEVICES

No person shall remove, alter or otherwise render inoperative, the exhaust emission control system, the evaporative control system, or crankcase ventilation, or any other air pollution control device which has been installed as a requirement of the Federal or State laws or regulations.

SUBCHAPTER VI. PROHIBITION OF PARTICULATE MATTER

5-461 DEFINITIONS

a. "Particulate Matter" is any material, except uncombined water, that exists in a finely divided form as a liquid or solid at standard condition.

b. "Combustion Contaminants" are particulate matter discharged into the atmosphere from the burning of any kind of material containing carbon in a free or combined state.

c. "Process Operations" means any method, form, action, operation, or treatment of manufacturing or processing, and shall include any storage or handling of materials or products before, during or after manufacturing or processing.

d. "Process Unit" refers to reactions where raw materials undergo chemical and/or physical change.

e. "Process Weight" is the total weight of all materials introduced into any specific process which may cause discharge into the atmosphere. Solid fuels charged will be considered as part of the process weight, but liquid and gaseous fuels and combustion air will not. "THE PROCESS WEIGHT PER HOUR" will be derived by dividing the total process weight by the number of hours in a complete operation from beginning of any given process to the completion thereof, excluding any time during which the equipment is idle.

f. "Fugitive Particulate Matter" means any particulate matter generated by a process operation which is emitted into the open air from points othe than a stack outlet.

g. "Incinerator" is any structure or furnace in which combustion takes plac the primary purpose of which is the reduction in volume and weight of a unwanted material.

h. "Multiple Chamber Incinerator" is any article, machine, equipment, contrivance, structure or part of a structure used to dispose of combustible refuse by burning, consisting of three or more refractory lined combustion furnaces in series, physically separated by refractory wall interconnected by gas passage ports or ducts and employing adequate design parameters necessary for maximum combustion of the material to be burned.

i. "BTU" means British Thermal Units, which is the amount of heat necessar to raise the temperature of one pound of water from 39°F to 40°F.

j. "Heat Input" shall be the aggregate heat content of all fuels whose products of combustion pass through a stack or stacks. The heat input value used shall be the equipment manufacturer's or designer's guaranteed maximum input, whichever is greater. The total heat of all fuel burning units on a plant or premises shall be used for determining the maximum allowable amount of particulate matter which may be emitted.

k. "Director" means the Director, Division of Industrial Hygiene, or his duly authorized representative.

5-462 INDUSTRIAL PROCESS EMISSIONS

a. A person shall not discharge, cause, suffer, allow or permit in any one hour from any source whatsoever dust or fumes in total quantities in excess of the amounts shown in the following table: (See Table I). For purposes of this subsection, similar process units will be considered a single process.

To use the table, take the process weight per hour as such is defined i the definition Process Weight. Opposite this number on the table is th maximum number of pounds of contaminants which may be discharged into the atmosphere in any hour. As in example, if A has a process which emits contaminants into the atmosphere and which process takes three hours to complete, he will divide the weight of all materials in a specific process, in this example, 1500 pounds, by three giving a proce weight per hour of 500 pounds. The table shows that A may not discharg more than 1.77 pounds in any hour of process. Where the process weight per hour falls between the figures in the left-hand column, the exact weight of the permitted discharge may be a linear interpolation.

b. In cases where process weight is not applicable as determined by the Director of Industrial Hygiene; the concentration of solid particulates in the effluent gas stream shall not exceed 0.1 lb/1000 lb. of undiluted exhaust gas at actual conditions.

c. Fugitive particulate matter shall not be included in the determination of the maximum allowable weight discharged per hour as it applies to subsection (a) unless the fugitive particulate matter enters an air cleaning system that was not specifically designed for the fugitive particulate matter.

d. If this section is in conflict with any interpretation of Section 5-466 (Fugitive Particulate Matter), the Director, Division of Industrial Hygiene shall determine which section shall apply.

5-463 INCINERATOR EMISSIONS

A person shall not discharge, cause, suffer, allow, permit air contaminants into the open air from any incinerator, particulate matter in the exhaust gases to exceed 0.10 pounds per 100 pounds of refuse burnt. All incinerators built and installed after July 1, 1971 shall be multiple chamber incinerators or equipment found by the Director, Division of Industrial Hygiene, in advance of such use, to be equally effective for the purpose of air pollution control as an approved multiple chamber incinerator. The responsibility for showing that the equipment other than a multiple chamber incinerator is in compliance with the emission limits of this section shall be on the person seeking to come within the provisions of this section.

5-464 COMBUSTION CONTAMINANTS

a. A person shall not discharge, cause, suffer, allow, or permit the emission of particulate matter caused by the combustion of fuel in fuel burning equipment from any stack or chimney.

a.1. in excess of 0.5 (five tenths) of a pound per hour per million BTU's of heat input in combustion installations where the heat input is rated at 10 million BTU's or less per hour.

a.2. In excess of allowable particulate emissions limitations as determined by Figure I for combustion installations where the heat input is greater than 10 million BTU's per hour, but where the heat input is less than 300 million BTU's per hour.

a.3. In excess of 0.1 (one tenth) of a pound per hour per million BTU's of heat input in installations where the heat input is rated greater than 300 million BTU's per hour.

a.4. In excess of 0.02 (two hundredths) of a pound per hour per million BTU's of heat input in installations constructed after July 1, 1971 where the heat input is rated greater than 1000 million BTU's per hour.

b. This regulation applies to installations in which fuel is burned for the primary purpose of producing steam, hot water, hot air or other liquids, gases, or solid, and in the course of doing so, the products of combustion do not come into direct contact with the process material. Fuels include coal, coke, lignite, fuel oil and wood, but does not include refuse. When any product or by-products of a manufacturing process are burned for the same purpose, or in conjunction with any fuel the same maximum emission limitation shall apply.

c. The provisions of this section shall not apply to a stationary industria gas turbine utilized as a combustion installation until July 1, 1972.

5-465 POTENTIAL HAZARDOUS PARTICULATE MATTER

Persons responsible for a source operation from which hazardous particulate matter may be emitted such as, but not limited to lead, silica and other such materials shall give the utmost care and consideration to the potential harmful effects of emissions resulting from such activities. Evaluation of these facilities as to the adequacy, efficiency and emission potential will be made on an individual basis by the Director, Division of Industrial Hygiene.

This subsection does not supersede any other regulations of the State Board of Health concerning these potentially hazardous air contaminants.

5-466 FUGITIVE PARTICULATE MATTER

No person shall discharge, cause, suffer, allow or permit any process operation to operate that is not equipped with a fugitive particulate matter control system. This system shall be operated in such a manner as to minimize the emission of fugitive particulate matter to a level satisfactory to the Director, Division of Industrial Hygiene.

5-467 EXCEPTION TO THE EFFECTIVE DATE

If an abatement schedule for compliance with this Subchapter is submitted and approved by the Director, Division of Industrial Hygiene, the provision of this Subchapter shall not apply until January 1, 1972.

SUBCHAPTER VII. PROHIBITION OF NUISANCE AND ODOR

5-471 DEFINITIONS

a. "Odor" means that property of gaseous, liquid or solid materials that elicit a physiologic response by the human sense of smell.

b. "Director" means the Director, Division of Industrial Hygiene, or his duly authorized representative.

5-472 NUISANCE

A person shall not discharge, cause, suffer, allow, or permit from any source whatsoever such quantities of air contaminants or other material which will cause injury, detriment, nuisance or annoyance to any considerable number of people or to the public or which endangers the comfort, repose, health or safety of any such persons or the public or which causes or has a natural tendency to cause injury or damage to business or property.

5-473 ODORS

A person shall not discharge, cause, suffer, allow or permit any emissions of objectionable odors beyond the property line of a premises. An objectionable odor shall mean those odors deemed objectionable by fifteen percent or more of a sample of people exposed to them. The number of people in the said sample shall be at least 20 or, if fewer than 20 people but greater than 4 (and provided that these persons are not from the same household) are exposed in a particular situation, 75 percent of the people exposed. The sample of people shall be taken from among those occupying or frequenting places closest to, but beyond the property line of the source of odors. Domestic odors are exempt from this section.

5-474 CONTROL OF ODOR FROM INDUSTRIAL PROCESSES

a. No person shall operate or use any device, machine, equipment or other contrivance for the industrial processes which as determined by the Director, Division of Industrial Hygiene is an odoriferous process per se, unless all gases, vapors, and gas-entrained effluents from such facility are incinerated at a temperature of 1600 degrees F. for a period of not less than five-tenths (0.5) second, or processed in such manner as determined by the Director, Division of Industrial Hygiene to be equally or more effective for the purpose of air pollution control.

b. Effective devices and measures shall be installed and operated in a manner such that no vent, exhaust pipe, blowoff pipe or opening of any kind shall discharge into the open air or atmosphere any odorous matter, air contaminants, dusts or any combination thereof which create odors or other nuisances.

c. Odor-producing materials shall be confined and handled in a manner such that odors produced within or outside the plant from such materials are controlled. Accumulation of odor-producing materials resulting from spillage or other means is prohibited.

d. Odor-bearing air contaminants arising from materials in process shall be confined at the point of origin so as to prevent liberation of odorous matter into the workroom and the confined air contaminants shall be treated before discharge to the atmosphere, as required in Section 5-464.

e. Whenever air contaminants escape from a building or buildings used for processing, handling or storage of materials used in the industrial processes specified in Section 5-464 in such manner and amount as to cause a nuisance or to violate this Subchapter, the Director shall order that said building or buildings be tightly closed and ventilated in such a way that all air contaminants are treated by incinerator or other means effective for their removal or destruction before discharge to the open air.

SUBCHAPTER VIII. OPERATIONS AND PROCEDURES

5-481 DEFINITIONS

"Director" means the Director, Division of Industrial Hygiene, or his duly authorized representative.

5-482 CIRCUMVENTION

No person shall build, erect, install or use any article, machine, equipment or other contrivances, the use of which, without resulting in a reduction in the total release of air contaminants to the atmosphere, reduces or conceals an emission which otherwise would constitute a violation of these regulations

5-483 PROVISIONS OF SAMPLING AND TESTING FACILITIES

a. Whenever the Director has reason to believe that the emission limits of these regulations are being violated, it may require the owner to conduct tests to determine the particulate matter emission level, which tests shall include stack tests if circumstances so demand. The Director may require that such tests be conducted in the presence of representatives of the Division.

b. Should the Director wish to conduct tests of his own to determine compliance with the emission limits of these regulations, the owner shall provide at no expense to the State of Vermont, reasonable and necessary openings in stacks, vents, and ducts, along with safe and easy access thereto, including a suitable power source to the point of testing.

c. The Director shall be supplied with such data as it may require to establish test conditions.

5-484 REQUIRED AIR MONITORING

The Director may require the owner or operator of any air contaminant source to install, use and maintain such monitoring equipment and records, establish and maintain such records, and make such periodic emission reports as the Director shall prescribe.

5-485 TESTING PROCEDURES

a. The method, or any conditions associated with the method, for source testing or air monitoring must be approved by the Director, Division of Industrial Hygiene.

SUBCHAPTER IX. AMBIENT AIR QUALITY STANDARDS

5-491 PREAMBLE

The ambient air quality standards as set forth in this Subchapter are based upon:

a. The United States Department of Health, Education and Welfare's published air quality criteria reflecting scientific knowledge indicating the kind and extent of identifiable effects on health and welfare which may be expected from the presence of an air contaminant, or combination of contaminants, in the ambient air in varying quantities.

b. The United States Department of Health, Education and Welfare's published information on air pollution control techniques and technology and costs of emission control which provides data on the economic feasibility of methods of prevention and control of air contamination and cost-effectiveness analyses.

c. Evidence presented at public hearing.

d. A policy of non-degradation wherein the objective of ambient air quality standards is to provide a basis for preventing, or abating the effects of air pollution including effects on health, esthetics, and economy. Since their objective is to improve air quality, the standards should not be interpreted as permitting, encouraging or condoning degradation of the present air quality which is superior to that stipulated in the standards.

5-492 DEFINITIONS

For the purpose of this Subchapter, the following words and phrases have these meanings:

a. "Air contaminant" means dust, fumes, mist, smoke, other particulate matter, vapor, gas odorous substances, or any combination thereof.

b. "Air pollution" means the presence in the outdoor atmosphere of one or more contaminants in such quantities and duration as is or tends to be injurious to human health or welfare, animal or plant life, or property, or would unreasonably interfere with the enjoyment of life or property; in accordance with the establishment of ambient air quality standards for the state as a whole or any part thereof, based on nationally recognized criteria applicable to the State of Vermont.

c. "Ambient Air Space" means the unconfined space occupied by the atmosphere above the geographic area of the State of Vermont.

d. "Annual Average" - a mean value arithmetic or geometric as indicated determined for a period of 12 consecutive months which need not coincide with the calendar year.

e. "Arithmetic Mean" - the sum of N factors divided by N.

f. "N" - the number of factors used in determining an arithmetic or geometric mean.

g. "Geometric mean" - the Nth root of the product of N factors (eg 3x4x5x6=4 $\sqrt{360}$=4.35+).

h. "Director" means the Director, Division of Industrial Hygiene, or his duly authorized representative.

i. "Standard" means a delineation of the maximum concentration and duration of a specific contaminant, alone or in conjunction with other contaminants in the ambient air space which is deemed compatible with man's health and welfare.

5-493 AIR MONITORING

The location of the monitoring stations, the method and frequency of sample collection, and the analytical procedures to be followed in the determination of the concentration of contaminants in the ambient air shall be as may be acceptable to the Division of Industrial Hygiene.

5-494 STANDARDS

a. Application

The presence in the ambient air space of contaminants in concentrations and durations exceeding these standards shall be deemed air pollution.

b. Total Suspended Particulates (T.S.P.)

b.1. Total suspended particulates shall be reported as ug/M^3 (micrograms per cubic meter) of air and shall be determined by the High Volume Air Sampling Procedure.*

b.2. The annual geometric average shall not exceed 45 ug/M^3.

b.3. The daily amount of total suspended particulates shall not exceed 125 ug/M^3.

c. Sulfur Dioxide (SO_2).

c.1. Sulfur dioxide concentrations shall be reported as ug/M^3 (micrograms per cubic meter) as determined by the Modified West-Gaeke Procedure.**

c.2. The annual average shall not exceed 57 ug/M^3 (0.02 part per million)

c.3. The daily average concentration shall not exceed 150 ug/M^3 (0.05 part per million).

c.4. The hourly concentration shall not exceed 285 ug/M^3(0.10 part per million).

d. Carbon Monoxide (CO)

d.1. Carbon Monoxide concentrations shall be reported as mg/M^3 (Milligrams per cubic meter) as determined by nondispersive infrared (NDIR) Procedures.***

*United States Public Health Service "Air Pollution Measurements of the National Air Sampling Network", P.H.S., Publication 978 - U.S. Govt. Printing Office, Wash., D.C.

**Scaringelli [illegible].P., Saltzman, V.E., & Fray, S.A., "Spectrophotometric Determination of Atmospheric Sulfur", Analytical Chemistry XXXIX (Dec. 1967) pp 1709-19.

***Intersociety Committee, Subcommittee IV on Carbon Compounds, Health Laboratory Science (January Supplement, 1970) p. 81-86.

d.2. Concentrations of carbon monoxide shall not exceed 10 mg/M^3 (8.7 parts per million) for any consecutive eight hour period.

e. Photochemical Oxidants

e.1. Photochemical oxidant concentrations shall be reported as ug/M^3 (micrograms per cubic meter) as determined by the Saltzman Modification of the Neutral Buffered Potussium Iodine Procedures.*

e.2. The hourly concentration shall not exceed 118 ug/M^3 (0.06 parts per million).

f. Hydrocarbons (HC)

A primary ambient air quality standard for hydrocarbons is not being proposed at this time based on the following reasons:

1.) there is an inferred inconsistency in the hydrocarbon criteria document** between the method for continuous monitoring and the standard which seems to be acceptable to the Environmental Protection Agency. Routine continuous measuring of hydrocarbons have utilized the measurement of total hydrocarbons while the criteria suggests a standard for non-methane hydrocarbons.

2.) recent amendment to the Federal Clean Air Act (December 31,1970) places the onus of adopting an ambient air quality standard for hydrocarbon on the Administrator of the Federal Environmental Protection Agency within 120 days of the enactment of the Clean Air Act.

3.) in order to maintain the primary standard for oxidant, it will be necessary to limit the hydrocarbon concentration to levels much below any level which gives rise directly to health effects.

SUBCHAPTER X. PROHIBITION OF GASEOUS AIR CONTAMINANTS

5-401 CONTROL OF NITROGEN OXIDES EMISSIONS

a. No person shall discharge, cause, allow or permit emissions of nitrogen oxides from a combustion installation with a capacity of 250 million BTU or more and completed after July 1, 1971 in excess of 0.30 pounds per million BTU of heat input per hour.

b. The provisions of this section shall not apply to a stationary industrial gas turbine utilized as a combustion installation until July 1, 1973.

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* ASTM Standard Method D2011-65

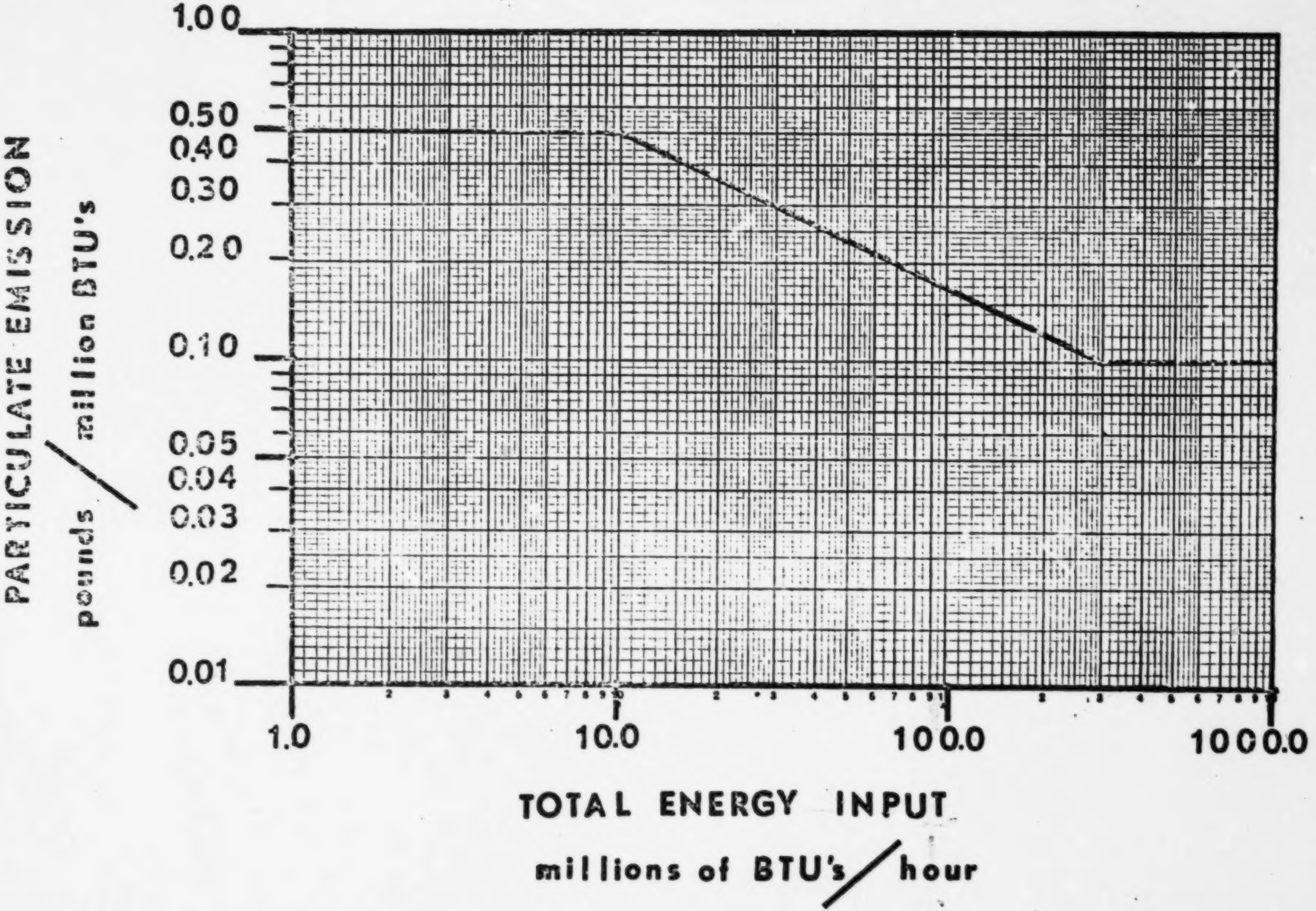
**Air Quality Criteria for Hydrocarbons, U.S. Department of Health, Education and Welfare, March 1970.

Industrial Process Weight Standards

TABLE I

Process Wt/hr(lbs)	Maximum Weight Disch/hr(lbs).	Process Wt/hr(lbs)	Maximum Weight Disch/hr(lbs)
50	.24	3400	5.44
100	.46	3500	5.52
150	.66		
200	.85	3600	5.61
250	1.03	3700	5.69
300	1.20	3800	5.77
350	1.35	3900	5.85
400	1.50	4000	5.93
450	1.63		
500	1.77	4100	6.01
		4200	6.08
550	1.89	4300	6.15
600	2.01	4400	6.22
650	2.12	4500	6.30
700	2.24		
750	2.34	4600	6.37
800	2.43	4700	6.45
850	2.53	4800	6.52
900	2.62	4900	6.60
950	2.72	5000	6.67
1000	2.80		
		5500	7.03
1100	2.97	6000	7.37
1200	3.12	6500	7.71
1300	3.26	7000	8.05
1400	3.40	7500	8.39
1500	3.54	8000	8.71
		8500	9.03
1600	3.66	9000	9.36
1700	3.79	9500	9.67
1800	3.91		
1900	4.03	10000	10.0
2000	4.14	11000	10.63
		12000	11.28
2100	4.24	13000	11.89
2200	4.34	14000	12.50
2300	4.44	15000	13.13
2400	4.55		
2500	4.64	16000	13.74
		17000	14.36
2600	4.74	18000	14.97
2700	4.84	19000	15.58
2800	4.92	20000	16.19
2900	5.02	30000	22.22
3000	5.10	40000	28.3
		50000	34.3
3100	5.18	60000 or More	40.0
3200	5.27		
3300	5.36		

Figure 1 -FUEL BURNING EQUIPMENT



APPENDIX C

DRAFT CHANGES TO THE STATE AIR POLLUTION ACT

(Dr. Req. 71-845 - Draft No. ~~3~~ 4)

Introduced by Mr. Cutts of Townshend

Referred to Committee on

Subject: Air pollution

Sponsor's statement of purpose: It is the purpose of this bill to revise the present air pollution law to make it consistent with governmental reorganization creating an agency of environmental conservation and delegating thereto responsibility for administration of the state's air quality control program; and to provide for effective enforcement through increased penalties, and a requirement for a permit to construct or operate air contaminant sources. In addition amendments are necessary to qualify for federal assistance.

AN ACT TO AMEND 10 V.S.A. §§ 351(a), 352-370 RELATING TO AIR POLLUTION CONTROL

It is hereby enacted by the General Assembly of the State of Vermont:

Sec. 1. 10 V.S.A. § 351(a) is amended to read:

§ 351. DECLARATION OF POLICY AND PURPOSE

(a) It is hereby declared to be the public policy of this state and the purpose of this chapter to achieve and maintain such levels of air quality as will protect human health and safety, and to the greatest degree practicable, prevent injury to plant and animal life and property, foster the comfort and convenience of the people, promote the economic and social development of this state and facilitate the enjoyment of the natural attractions of this state and to assure that adverse effects upon the environment are fully considered and borne by those who cause them.

Sec. 2. 10 V.S.A. § 352 is amended to read:

§ 352. DEFINITIONS

(a) As used in this chapter:

(1) "Agency" means the agency of environmental conservation, state of Vermont.

[(1)] (2) "Air contaminant" means dust, fumes, mist, smoke, other particulate matter, vapor, gas, odorous substances, or any combination thereof.

[(2)] (3) "Air pollution" means the presence in the outdoor atmosphere of one or more air contaminants in such quantities, magnitudes [and] or [duration] durations as [is] are or tend[s] to be injurious to human health or welfare, animal or plant life, or property, or [would unreasonably] interfere with the enjoyment of life or property [;] . in accordance with the establishment of ambient and emission air quality standards for the state as a whole or any part thereof, based on nationally recognized criteria applicable to the state of Vermont.

[(3)] (4) "Emission" means a release into the outdoor atmosphere of air contaminants.

[(4) "Person" means any individual, or group of individuals organized for fraternal or any other purpose, partnership, firm, association, municipality, public or private corporation, state agency or subdivision of the state, or any other legal entity.]

(5) "Person" means any individual, partnership, public or private corporation, or group of individuals organized for fraternal or any other purpose, municipality, institution or agency of the state or subdivision of the state, or any other legal entity, and includes any officer or governing or managing body of a partnership, association, or firm or corporation.

(6) "Secretary" means the secretary of the agency of environmental conservation or such person as the secretary may designate.

Sec. 3. 10 V.S.A. § 353 is amended to read:

§ 353. AGENCY

[The state board of health is hereby designated as the air pollution control agency hereinafter referred to as the agency. The commissioner of health shall designate the director of industrial hygiene as director of the division who shall perform the functions vested in the agency.] The agency is designated as the air pollution control agency for the state. The secretary or his duly designated representative, within the agency, shall perform the functions vested in the agency, as specified in the following sections of this chapter.

Sec. 4. 10 V.S.A. § 354 is amended to read:

§ 354. POWERS

(a) In addition to any other powers conferred on it by law the [state board of health] secretary shall have power to:

(1) Appoint and employ personnel and consultants as may be necessary for the administration of this chapter.

(2) Adopt, amend and repeal rules, implementing the provisions of this chapter.

(3) Require permits for the construction of air contaminant sources, and require permits for the operation of air contaminant sources.

[(3)] (4) Hold hearings related to any aspect of or matter in the administration of this chapter, and in connection therewith, subpoena witnesses and the production of evidence.

[(4)] (5) Issue orders as may be necessary to effectuate the purposes of this chapter and enforce the same by all appropriate administrative and judicial proceedings.

[(5)] (6) Prepare and develop a comprehensive plan or plans for the prevention, abatement and control of air pollution in this state.

[(6)] (7) Encourage voluntary cooperation by persons and [effected] affected groups to achieve the purposes of this chapter.

[(7)] (8) Encourage local units of government to handle air pollution problems within their respective jurisdiction, and by compact on a cooperative basis, and to provide technical and consultative assistance therefor.

[(8)] (9) Encourage and conduct studies, investigations and research relating to air contamination and air pollution and their causes, effects, prevention, abatement and control.

[(9)] (10) Determine by appropriate means the degree of air contamination and air pollution in the state and the several parts thereof.

[(10)] (11) Make a continuing study of the effects of the emission of air contaminants from motor vehicles on the quality of the outdoor atmosphere of this state and the several parts thereof, and make recommendations to appropriate public and private bodies with respect thereto.

[(11)] (12) Establish ambient air quality and emission standards by regulation for the state as a whole or for any part thereof, based on nationally recognized criteria applicable to the state of Vermont.

[(12)] (13) Collect and disseminate information and conduct educational and training programs relating to air contamination and air pollution.

[(13)] (14) Advise, consult, contract and cooperate with other agencies of the state, local governments, industries, other states, interstate or interlocal agencies, and the federal government, and with interested persons or groups.

[(14)] (15) Consult, upon request, with any person proposing to construct, install, or otherwise acquire an air contaminant source or device or system for the control thereof, concerning the efficacy of the device or system, or the air pollution problem which may be related to the source, device or system. Nothing in any consultation shall be construed to relieve a person from compliance with this chapter, rules in force pursuant thereto, or any other provision of law.

[(15)] (16) Accept, receive and administer grants or other funds or gifts from public and private agencies, including the federal government, for the purpose of carrying out any of the functions of this chapter. The funds received by the [state board of health] secretary pursuant to this section shall be deposited in the state treasury to the account of the [state board of health] agency.

[(16)] (17) Have access to records relating to emissions which cause or contribute to air contamination.

Sec. 5. 10 V.S.A. § 355 is amended to read:

§ 355. CLASSIFICATION AND REPORTING

(a) The [state board of health] secretary, by rule, may classify air contaminant sources, which in [its] his judgment may cause or contribute to air pollution, according to levels and types of emissions and other characteristics which relate to air pollution, and may require reporting by any class. Classifications made pursuant to this subsection may apply to the state as a whole or to any designated area of the state, and shall be made with special reference to effects on health, economic and social factors, and physical effects on property.

(b) Any person operating or responsible for the operation of air contaminant sources of any class for which the rules of the [state board of health] agency require reporting shall make reports containing information as required by the [state board of health] agency concerning location, size and height of contaminant outlets, processes employed, fuels used and the nature and time periods of duration of emissions, and such other information relevant to air pollution [and available or reasonably capable of being assembled].

Sec. 6. 10 V.S.A. § 356 is amended to read:

§ 356. PERMIT REQUIRED TO CONSTRUCT

[(a) The state board of health may require that notice be given to it prior to the undertaking of the construction or installation of particular types or classes of new air contaminant sources specified in its rules and regulations. Within fifteen days of its receipt of the notice, the state board of health may require, as a condition precedent to the construction or installation or establishment of the air pollution source or sources covered thereby, the submission of plans, specifications, and other information as it deems necessary in order to determine whether the proposed construction or installation will be in accord with applicable rules in force pursuant to this chapter. Within thirty days of the receipt of plans, specifications or other information required pursuant to this section the state board of health shall determine if the proposed construction or installation is in accord with the requirements of this chapter or applicable rules and shall issue an order approving or prohibiting the construction or installation or establishment of the air contaminant source or sources, or give approval upon fulfillment of specified conditions. Failure of such an order to issue within the time prescribed herein shall be deemed a determination that the construction, installation or establishment may proceed provided that it is in accordance with the plans, specifications or other information, if any, required to be submitted.

(b) In addition to other remedies available on account of the issuance of an order prohibiting construction or installation and prior to invoking any remedies, the person or persons aggrieved thereby shall, upon request in accordance with rules of the state board of health, be entitled to a hearing on the order. Following such hearing, the order may be affirmed, modified or withdrawn.

(c) For the purposes of this chapter, addition to or enlargement or replacement of an air contaminant source, or any major alteration therein, shall be construed as construction or installation of a new air contaminant source.

(d) All facilities or parts thereof called for by plans, specifications or other information submitted pursuant to subsection (a) of this section shall be maintained in good working order.

(e) Nothing in this section shall be construed to authorize the state board of health to require the use of a facility available only from a particular supplier or produced by a particular manufacturer.

(f) The absence or failure to issue a rule or order pursuant to this section shall not relieve any person from compliance with any emission control requirements or with any other provision of law.]

(a) No person shall build, erect, alter, replace, sell or rent any stationary air contaminate source specified by regulation, the use of which may cause the issuance of air contaminants, without first obtaining a permit to do so from the secretary.

(b) No person shall operate, maintain or use any stationary air contaminate source specified by regulation the use of which may cause the issuance of air contaminants, without first obtaining a permit to do so from the secretary.

(c) Any person required to obtain a permit under subsection (a) or (b) of this section, shall make application to the secretary for such permit. Application shall be made on a form prescribed by the secretary and shall contain such information as the secretary may therein require. An applicant shall pay to the secretary at the time of submitting his application such amount as the secretary shall by rule determine reasonable to defray the expense of reviewing and evaluating an application; provided, however, that an applicant who pays a fee for a permit under subsection (a) of this section shall not be required to pay thereafter any additional fee for a permit to operate such stationary air contaminate source under subsection (b) of this section.

(d) The secretary shall consider each application and shall grant or deny the requested permit within 60 days from the date of receipt of the application. The secretary may require the applicant to submit any additional information which he considers necessary.

(e) If the secretary determines that the applicant can satisfy the requirements of this chapter or applicable regulations he shall issue the permit applied for or give approval upon fulfillment of specified conditions. If the secretary determines that the applicant cannot meet the requirements of this chapter or applicable regulations he shall deny the application and refuse to issue a permit. In any event the secretary shall grant or deny a permit within 60 days from the date of receipt of an application therefor.

(f) For the purposes of this chapter, addition to or enlargement or replacement of an air contaminant source, or any major alteration thereof, shall be construed as construction or installation of a new air contaminant source.

(g) The secretary may revoke by order any permit issued by him pursuant to this chapter if he finds that the permit holder submitted false or inaccurate information in his application or has violated any requirement, restriction or condition of the permit issued. Revocation shall be effective subject to rights of appeal upon actual notice thereof to the permit holder.

Sec. 7. 10 V.S.A. § 357 is amended to read:

§ 357. INSPECTIONS

(a) Any duly authorized officer, employee, or representative of the [state board of health] agency may enter and inspect any property, premise or place on or at which an air contaminant source is located or is being constructed or installed at any reasonable time for the purpose of ascertaining the state of compliance with this chapter and rules in force pursuant thereto. [No authorized person shall refuse entry or access to any authorized representative of the state board of health who requests entry for purposes of inspection, and who presents appropriate credentials; nor shall any person obstruct, hamper or interfere with the inspection. If requested, the owner or operator of the premises shall receive a report setting forth all facts found which relate to compliance status.] The secretary may apply for and obtain orders from county court to enter upon premises for the inspection thereof upon showing that reasonable grounds exist for believing that emissions eminate from such premises in violation of the regulations.

(b) If an authorized employee of the agency of environmental conservation during the course of an inspection obtains a sample of air contaminant, fuel, process material or other material, he shall give the owner or operator of the equipment or fuel facility a receipt for the sample obtained.

Sec. 8. 10 V.S.A. § 358 is amended to read:

§ 358. EMISSION CONTROL REQUIREMENTS

The [state board of health] secretary may establish such emission control requirements, by [rule] regulation, as in [its] his judgment may be necessary to prevent, abate, or control air pollution. The requirements may be for the state as a whole or may vary from area to area, as may be appropriate to facilitate accomplishment of the purposes of this chapter, and in order to take necessary or desirable account of varying local conditions.

Sec. 9. 10 V.S.A. § 359 is amended to read:

§ 359. ENFORCEMENT

[(a) Whenever the state board of health has reason to believe that a violation of any provision of this chapter or rule pursuant thereto has occurred, it may cause written notice to be served upon the alleged violator or violators. The notice shall specify the provision of this chapter or rule alleged to be violated, and the facts alleged to constitute a violation thereof, and may include an order that necessary corrective action be taken within a reasonable time. The order shall become final unless, no later than thirty days after the date the notice and order are served, the person or persons named therein request in writing a hearing before the state board of health. Upon receipt of the request, the state board of health shall hold a hearing. In lieu of an order, the state board of health may require that the alleged violator or violators appear before the state board of health for a hearing at a time and place specified in the notice and answer the charges complained of, or the state board of health may initiate action pursuant to section 367 of this title.

(b) If, after a hearing held pursuant to subsection (a) of this section, the state board of health finds that a violation or violations have occurred, it shall affirm or modify its order previously issued, or issue an appropriate order or orders for the prevention, abatement or control of the emissions involved or for the taking of such other corrective action as may be appropriate. If, after hearing on an order contained in a notice the state board of health finds that no violation is occurring, it shall rescind the order. Any order issued as part of a notice or after hearing may prescribe a time schedule for necessary action in preventing, abating or controlling the emissions.

(c) Nothing in this chapter shall prevent the state board of health from making efforts to obtain voluntary compliance through warning, conference or any other appropriate means.

(d) In connection with any hearing held pursuant to this section, the state board of health shall have power and upon application by any party it shall have the duty to subpoena witnesses and the production of evidence on behalf of all parties.]

Notwithstanding any other provision or procedure set forth in this chapter and in addition to such other powers as may be provided for by law, if the secretary determines that any person is acting or has acted without a permit where a permit is required, or violated the terms of a permit which has been issued, or violated the emission control requirements established by the secretary, or that any other violation of the provisions of this chapter or regulations pursuant thereto has occurred, he may bring suit in the Washington county court or any county where the pollution or other violation has occurred to enjoin such pollution or violation or obtain compliance with this chapter. The court may issue a temporary injunction or order in such proceedings and may exercise all the plenary powers available to such court. Nothing in this chapter shall prevent the secretary from making efforts to obtain voluntary compliance through warning, conference or any other appropriate means.

Sec. 10. 10 V.S.A. § 360 is amended to read:

§ 360. EMERGENCY PROCEDURES

(a) Any other provisions of law to the contrary notwithstanding, if the [state board of health] secretary finds that a generalized condition of air pollution exists and that it [creates] is creating an emergency requiring immediate action to protect human health or safety, with the concurrence of the governor, the [state board of health] secretary shall order persons causing or contributing to the air pollution to reduce or discontinue immediately the emission of air contaminants and such order shall fix a place and time not later than twenty-four hours thereafter for a hearing to be held before the [director] secretary. Not more than twenty-four hours after the commencement of such hearing and without adjournment thereof, the [director] secretary shall affirm, modify or set aside the order.

(b) In the absence of a generalized condition of air pollution of the type referred to in subsection (a) of this section, if the [state board of health] secretary finds that emissions from the operation of one or more air contaminant sources is causing imminent danger to human health or safety, the [director of industrial hygiene] secretary may order the person or persons responsible for the operation or operations in question to reduce or discontinue emissions immediately [, without regard to the provisions of section 359 of this title. In that event, the requirements for hearing and affirmance, modification or setting aside of orders set forth in subsections 359(a) and 359(b) shall apply].

(c) Nothing in this section shall be construed to limit any power which the governor or any other officer may have to declare an emergency and act on the basis of such declaration.

Sec. 11. 10 V.S.A. § 361 is amended to read:

§ 361. VARIANCES

(a) A person who owns or is in control of any plant, building, structure, process or equipment may apply to the [state board of health] secretary for a variance from [its] his rules. The [state board of health] secretary may grant a variance if [it] he finds that:

(1) The emissions occurring or proposed to occur do not endanger or tend to endanger human health or safety; and

(2) Compliance with the rules from which variance is sought would produce serious hardship without equal or greater benefits to the public.

(b) No variance shall be granted pursuant to this section except after public hearing on due notice and until the [state board of health] secretary has considered the relative interests of the applicant, other owners of property likely to be affected by the discharges, and the general public.

(c) Any variance or renewal thereof shall be granted within the requirements of subsection (a) of this section and for time periods and under conditions consistent with the reasons therefor, and within the following limitations:

(1) If the variance is granted on the ground that there is no practicable means known or available for the adequate prevention, abatement or control of the air pollution involved, it shall be only until the necessary practicable means for prevention, abatement or control become known and available, and subject to the taking of any substitute or alternate measures that the [state board of health] secretary may prescribe.

(2) If the variance is granted on the ground that compliance with the particular requirement or requirements from which variance is sought will necessitate the taking of measures which because of their extent or cost, must be spread over a considerable period of time, it shall be for a period not to exceed such reasonable time as, in the view of the [state board of health] secretary is requisite for the taking of the necessary measures. A variance granted on the ground specified herein shall contain a time schedule for the taking of action in an expeditious manner and shall be conditioned on adherence to the time schedule.

(3) If the variance is granted on the ground that it is justified to relieve or prevent hardship of a kind other than that provided for in items 1 and 2 of this subparagraph, it shall be for not more than one year.

(d) Any variance granted pursuant to this section may be renewed on terms and conditions and for periods which would be appropriate on initial granting of a variance. If complaint is made to the [state board of health] secretary on account of the variance, no renewal thereof shall be granted, unless following public hearing on the complaint on due notice, the [state board of health] secretary finds that renewal is justified. No renewal shall be granted except on application therefor. The application shall be made at least sixty days prior to the expiration of the variance. Immediately upon receipt of an application for renewal the [state board of health] secretary shall give public notice of the application in accordance with rules of the [state board of health] secretary.

(e) A variance or renewal shall not be a right of the applicant or holder thereof but shall be in the discretion of the [state board of health] secretary. However, any person adversely affected by a variance or renewal granted by the [state board of health] secretary may obtain judicial review thereof by a proceeding in the appropriate court.

(f) Nothing in this section and no variance or renewal granted pursuant hereto shall be construed to prevent or limit the application of the emergency provisions and procedures of section 360 of this chapter to any person or his property.

Sec. 12. 10 V.S.A. § 362 is amended to read:

§ 362. APPEALS

[(a) No rule or regulation and no amendment or repeal thereof shall take effect except after public hearing. The state board of health shall appoint a time and place for the hearing and shall order the publication of the substance thereof and of the time and place of hearing two weeks successively in the daily newspapers of the state, the last publication to be at least seven days before the day appointed for the hearing.

(b) Nothing in this section shall be construed to require a hearing before issuance of an emergency order pursuant to section 360 of this chapter.

(c) Any person aggrieved by any order of the state board of health may have judicial review thereof by appeal under section 2382 of Title 12 within thirty days of the date of the order.]

Any person or party in interest aggrieved by any order or decision of the secretary may appeal such order or decision within thirty days from the date thereof to the county court in the county in which the emission source is located.

Sec. 13. 10 V.S.A. § 363 is amended to read:

§ 363. CONFIDENTIAL RECORDS; PENALTY

(a) Confidential records. Any records or other information furnished to or obtained by the [state board of health concerning one or more] secretary with regard to air contaminant sources, which records or information, as certified by the owner or operator, relate to production or sales figures or to processes or production unique to the owner or operator or which would [tend to] affect adversely the competitive position of the owner or operator, shall be only for the confidential use of the [state board of health] secretary in the administration of this chapter, unless the owner or operator shall expressly agree to their publication or availability to the general public. Nothing herein shall be construed to prevent the use of the records or information by the [state board of health] secretary in compiling or publishing analyses of summaries relating to the general condition of the outdoor atmosphere: provided that the analyses or summaries do not [identify any owner or operator or] reveal any information which would otherwise be confidential [under this section]. All other information furnished to or obtained by the agency shall be made available to the public as any other public records maintained by the agency.

(b) [Penalty. A person who knowingly violates this section shall be fined not to exceed $100.00.] Notwithstanding subsection (a) of this section, the disclosure of otherwise confidential information is hereby authorized when necessary for the judicial enforcement of this chapter or regulations promulgated pursuant thereto.

(c) Penalty. A person who knowingly violates this section shall be fined not more than $100.00.

Sec. 14. 10 V.S.A. § 364 is amended to read:

§ 364. LOCAL AIR POLLUTION CONTROL PROGRAMS

(a) A municipality may establish and thereafter administer within its jurisdiction an air pollution control program which:

(1) Provides by ordinance or local law for requirements compatible with, or stricter or more extensive than those imposed by [sections] section 358 [, 360 and 361] of this chapter and regulations issued thereunder;

(2) Provides for the enforcement of such requirements by appropriate administrative and judicial process;

(3) Provides for administrative organizations, staff, financial and other resources necessary to effectively and efficiently carry out its program; and

(4) Is approved by the [state board of health] secretary as adequate to meet the requirements of this chapter and any applicable rules and regulations pursuant thereto.

(b) A municipality may administer all or part of its air pollution control program in a compact if the program meets the requirements of subsection (a) of this section.

(c) If an approved local air pollution authority so petitions and the [state board of health] secretary finds that the control of a particular class of air contaminant source because of its complexity or magnitude is beyond the reasonable capability of the local air pollution control authorities or may be more efficiently and economically performed at the state level, [it] he may assume and retain jurisdiction over that class of air contaminant source. Classifications pursuant to this paragraph may be either on the basis of the nature of the sources involved or on the basis of their relationship to the size of the communities in which they are located.

(d) Nothing in this chapter shall be construed to supersede or oust the jurisdiction of any local air pollution control program in operation on July 1, 1968; provided that within two years from such date any such program shall meet all requirements of this chapter for a local air pollution control program. Any approval required from the [state board of health] secretary shall be deemed granted unless the [state board of health] secretary takes specific action to the contrary.

Sec. 15. 10 V.S.A. § 365 is amended to read:

§ 365. STATE AND FEDERAL AID

Local air pollution control agencies established or approved pursuant to this chapter may make application for, receive, administer and expend federal funds for the control of air pollution or the development and administration of programs related to air pollution control, provided the application is first submitted to and approved by the [state board of health] secretary. The [state board of health] secretary shall approve the application if it is consistent with this chapter and any other applicable requirements of law.

Sec. 16. 10 V.S.A. § 366 is amended to read:

§ 366. MOTOR VEHICLE POLLUTION

(a) The [state board of health] secretary in conjunction with the motor vehicle department may provide rules for the control of emissions from motor vehicles. Such rules may prescribe requirements for the installation and use of equipment designed to reduce or eliminate emissions and for the proper maintenance of the equipment and the vehicles. Rules pursuant to this section shall be consistent with provisions of federal law, if any, relating to control of emissions from the vehicles concerned and shall not require, as a condition precedent to the initial sale of a vehicle or vehicular equipment, the inspection, certification or other approval of any feature or equipment designed for the control of emissions from motor vehicles, if the feature or equipment has been certified, approved or otherwise authorized pursuant to federal law.

(b) Except as permitted or authorized by law, no person shall fail to maintain in good working order or remove, dismantle or otherwise cause to be inoperative any equipment or feature constituting an operational element of the air pollution control system or mechanism of a motor vehicle and required by rules pursuant to this chapter to be maintained in or on the vehicle. Any failure to maintain in good working order or removal, dismantling or causing of inoperability shall subject the owner or operator to suspension or cancellation of the registration for the vehicle by the motor vehicle department; in addition thereto a motor vehicle which is not in conformance with the emission standards established pursuant to this section may be operated on any public highway until the vehicle has been repaired or otherwise rendered capable of operation in conformance with the standards. [The vehicle shall not thereafter be eligible for registration until all parts and equipment constituting operational elements of the motor vehicle have been restored, replaced or repaired and are in good working order.]

(c) The [state board of health] secretary shall consult with the motor vehicle department and furnish it with technical information, including testing techniques, standards and instructions for emission control features and equipment.

(d) When rules have been issued requiring the maintenance of features or equipment in or on motor vehicles for the purpose of controlling emissions therefrom, no motor vehicle shall be issued an inspection sticker unless all the required features or equipment have been inspected in accordance with the standards, testing techniques and instructions furnished pursuant to subsection (b) [hereof] of this section and has been found to meet those standards.

[(e) The remedies and penalties provided here apply to violations of section 366 and provisions of section 367 of this title shall not apply.]

[(f)] (e) As used in this section "motor vehicle" shall have the same meaning as defined in section 4 of Title 23.

Sec. 17. 10 V.S.A. § 367 is amended to read:

§ 367. PENALTIES

(a) Any person who violates a provision of this chapter [,] or any rules or regulations adopted pursuant thereto or who fails, neglects or refuses to obey or comply with any section of this chapter or with any order or the terms of any permit issued in accordance with this chapter, [except sections 353 and 356 or any rule] shall be fined not [to exceed $2,000.00] more than $5,000.00.

[In the event such violation is of any of the terms and conditions of an order of the state board of health issued under section 359 of this chapter, the expiration of each 30-day period after the expiration of the reasonable time specified in that order during which corrective action must be taken shall constitute a separate violation under this section. In the event such violation is of any of the terms and conditions of an order of the state board of health issued under section 360 of this title, the expiration of each five-day period after the effective date of that order shall constitute a separate violation under this section.]

(b) Each violation shall be a separate and distinct offense and, in the case of a continuing violation, each day of continuance thereof shall be deemed a separate and distinct offense.

Sec. 18. 10 V.S.A. § 368 is amended to read:

§ 368. LIMITATIONS

(a) Nothing in this chapter shall be construed to:

[(a)] (1) Affect the relations between employers and employees with respect to or arising out of any condition of air contamination or air pollution.

[(b)] (2) Supersede or limit the applicability of any law or ordinance relating to sanitation, industrial health or safety.

[(c)] (3) Grant to the [director] secretary any jurisdiction or authority with respect to air contamination existing solely within commercial and industrial plants, works or shops or private property appurtenant thereto.

Sec. 19. 10 V.S.A. § 369 is amended to read:

§ 369. EXEMPTION FROM TAXATION

[Approved air] Air pollution treatment facilities as approved by the secretary shall be exempted from real and personal property taxation in the same manner provided tax exemption of water treatment facilities under the provisions of section 3802 of Title 32.

Sec. 20. 10 V.S.A. § 370 is amended to read:

§ 370. CONSTRUCTION WITH OTHER LAWS

When a person as defined in section 352, subsection (4), is required to abate a source of air pollution existing at the date of passage of this chapter and to concurrently abate a source of water pollution in accord with any existing Vermont water resources board's classification order document issued pursuant to sections

902-908 of Title 10, water pollution control, the [state board of health] secretary, the Vermont water resources board and the person or their designated representatives shall meet and establish a properly coordinated program for the abatement of air and water pollution sources concurrently or in sequence. Such program shall specify a reasonable time within which facilities for abatement shall be in use, having regard for the rights and interests of the general public, and reasonableness and equity of the cost of installation of the pollution abatement devices. New sources of air pollution notwithstanding are subject to abatement.

Sec. 21. This act shall take effect July 1, 1972.

APPENDIX D

ACT 93, 1971 LEGISLATIVE SESSION

NO. 93. AN ACT TO ADD 3 V.S.A. 2803(c), 2822(c) AND 10 V.S.A. 912a(e)(3) RELATING TO ENFORCEMENT POWERS OF THE SECRETARY OF THE AGENCY OF ENVIRONMENTAL CONSERVATION AND TEMPORARY POLLUTION PERMITS.

(S. 22)

It is hereby enacted by the General Assembly of the State of Vermont:

Sec. 1. 10 V.S.A. 912a(e)(3) is added to read:

(3)(A) Notwithstanding any other provision or procedure set forth in this subchapter, or contained in any rules or regulations duly adopted by the board, a person qualifying for and obtaining a temporary pollution permit shall not be assessed a pollution charge until the year commencing July 1, 1972 provided the department shall find that the plans and reasonable schedules for construction, installation or operation of an approved pollution abatement facility or alternate waste disposal system have been established and that the necessary financing, including approvals by state or federal agencies of financial participation, if any, may be reasonably anticipated before July 1, 1972.

(B) Commencing July 1, 1972, said pollution charges shall accrue as provided in the regulations of the board establishing said charges.

(C) A person holding a temporary pollution permit under the provisions of this subsection, who abandons or rescinds or otherwise fails or refuses to carry out his plans upon which the temporary permit has been granted, shall thereupon be assessed the charges which would otherwise have been applicable for the year commencing July 1, 1971 which charges together with the charges accrued from July 1, 1972 shall be immediately due and payable.

Sec. 2. 3 V.S.A. § 2803 is amended by adding a new subsection (c) to read:

(c) The chief game warden and state and deputy game wardens may also enforce the laws set forth in Title 25, in chapter 17 of Title 31, in chapter 33 of Title 10 and in section 2201 of Title 24.

Sec. 3. 3 V.S.A. § 2822(c) is added to read:

(c) (1) In addition to any other enforcement powers that may be provided for by law the secretary, or his duly designated representative, on behalf of the agency may institute proceedings under this section to enforce the following statutes and any regulations duly promulgated thereunder: chapter 151 of Title 10; chapter 33 of Title 10; chapter 15 of Title 10.

(2) Restraining prohibited acts. Whenever the secretary believes that any person is in violation of the provisions of any act or regulation as specified in subdivision (1) of this subsection he may bring action in the name of the agency in a court of competent jurisdiction against the person to restrain by temporary or permanent injunction the continuation or repetition of the violation. The court may issue temporary or permanent injunctions without bond, and such other relief as may be necessary and appropriate for abatement of any violation.

(3) Assurance of discontinuance. In any case in which the secretary has authority to institute an action or proceeding under this subsection, in lieu thereof he may accept an assurance of discontinuance of any violation of any of the statutes and regulations specified in this subsection including schedules of abatement for a violation. Any such assurance of discontinuance shall be in writing and be filed with the attorney general and the court having jurisdiction over the subject matter. The attorney general, within ten days of receipt of the assurance, if he objects to the terms thereof, may petition the board having jurisdiction over the subject matter for a hearing on the violation in the manner prescribed by law. The board shall hold a hearing on the petition within 30 days of its receipt and shall issue an appropriate order within 15 days thereafter. Evidence of a violation of such assurance shall be prima facie proof of violation of a statute or regulation specified above as cited in such assurance. Prior to institution of any action or proceeding under this subsection, the secretary whenever he believes any person to be or to have been in violation of any statute or regula-

tion specified in this subsection may issue a notice of violation setting forth the nature of the violation, the corrective action necessary to abate such violation, and notice of intention to institute an action or proceeding against the person responsible for such violation. In such event the secretary shall provide such person within 30 days of such notice an opportunity to be heard and an opportunity to settle the matter by an assurance to discontinue prior to instituting an action or proceeding as provided for in this subsection.

(4) Civil penalty. Any person who violates the terms of an order issued by a court under this subsection shall forfeit and pay to the state a civil penalty of not less than $100.00 and not more than $10,000.00 for each violation; provided however, where violation of an order is of a continuing nature, each day during which such violation continues after the date fixed by the court for the correction or termination of the violation shall constitute an additional separate and distinct offense except during the time an appeal from the order may be taken or is pending. For the purposes of this subsection, the court issuing the injunction on petition of the secretary shall retain jurisdiction for purposes of awarding the civil penalty.

Sec. 4. This act shall take effect from passage.

Approved: April 22, 1971.

APPENDIX E

VERMONT LAND USE AND DEVELOPMENT CONTROL

(H. 417) Act No. 250 of the Acts of 1970

An Act to create an Environmental Board and District Commissions

Sec. 1 Findings and declaration of intent.

WHEREAS, the unplanned, uncoordinated and uncontrolled use of the lands and the environment of the state of Vermont has resulted in usages of the lands and the environment which may be destructive to the environment and which are not suitable to the demands and needs of the people of the state of Vermont; and

WHEREAS, a comprehensive state capability and development plan and land use plan are necessary to provide guidelines for utilization of the lands and environment of the state of Vermont and to define the goals to be achieved through land environmental use, planning and control; and

WHEREAS, it is necessary to establish an environmental board and district environmental commissions and vest them with the authority to regulate the use of the lands and the environment of the state according to the guidelines and goals set forth in the state comprehensive capability and development plan and to give these commissions the authority to enforce the regulations and controls; and

WHEREAS, it is necessary to regulate and control the utilization and usages of lands and the environment to insure that, hereafter, the only usages which will be permitted are not unduly detrimental to the environment, will promote the general welfare through orderly growth and development and are suitable to the demands and needs of the people of this state;

Now, therefore, the legislature declares that in order to protect and conserve the lands and the environment of the state and to insure that these lands and environment are devoted to uses which are not detrimental to the public welfare and interests, the state shall, in the interest of the public health, safety and welfare, exercise its power by creating a state environmental board and district environmental commissions conferring upon them the power to regulate the use of lands and to establish comprehensive state capability, development and land use plans as hereinafter provided.

Sec. 2. Definitions

When used in this Act:

(1) "Board" means the environmental board.

(2) "Capability and development plan" means the plan prepared pursuant to section 19.

(3) "Development" means the construction of improvements on a tract or tracts of land, owned or controlled by a person, involving more than 10 acres of land within a radius of five miles of any point on any involved land, for commercial, or industrial purposes. "Development" shall also mean the construction of improvements for commercial or industrial purposes on more than one acre of land within a municipality which has not adopted permanent zoning and subdivision by-laws. The word "development" shall mean the construction of housing projects

such as cooperatives, condominiums, or dwellings, or construction or maintenance of mobile homes or trailer parks, with 10 or more units, constructed or maintained on a tract or tracts of land, owned or controlled by a person, within a radius of five miles of any point on any involved land. The word "development" shall not include construction for farming, logging or forestry purposes below the elevation of 2500 feet. The word "development" also means the construction of improvements on a tract of land involving more than 10 acres which is to be used for municipal or state purposes. In computing the amount of land involved, land shall be included which is incident to the use such as lawns, parking areas, roadways, leaching fields and accessory buildings. The word "development" shall not include an electric generation or transmission facility which requires a certificate of public good under section 246 of Title 30. The word "development" shall also mean the construction of improvements for commercial, industrial or residential use above the elevation of 2500 feet.

(4) "District commission" means the district environmental commission.

(5) "Land Use Plan" means the plan prepared pursuant to section 20.

(6) "Lot" means an undivided interest in land of less than 10 acres, whether freehold or leasehold, including, but not limited to, interests created by trusts, partnerships, corporations, cotenancies and contracts.

(7) "Plat" means a map or chart, of a subdivision with surveyed lot lines and dimensions.

(8) "Person" shall mean an individual, partnership, corporation, association, unincorporated organization, trust or any other legal or commercial entity, including a joint venture or affiliated ownership. The word "person" also means a municipality or state agency.

(9) "Subdivision" means a tract or tracts of land, owned or controlled by a person, which have been partitioned or divided for the purpose of resale into 10 or more lots within a radius of five miles of any point on any lot, and within any continuous period of 10 years after the effective date of this act. In determining the number of lots, a lot shall be counted if any portion is within 5 miles.

Sec. 3. Board created, removal

(a) An environmental board is created. The board shall consist of nine members appointed in the month of February by the Governor, with the advice and consent of the Senate, so that five appointments expire in each odd numbered year. Eight of the members shall be appointed for a term of four years. The Chairman (ninth member) shall be appointed for a two year term.

(b) Any vacancy occurring in the membership of the board shall be filled by the governor for the unexpired portion of the term.

(c) Members shall be removable for cause only, except the chairman, who shall serve at the pleasure of the Governor.

Sec. 4. Administrative organization

(a) The board may appoint an executive officer and other employees, including administrative personnel, as it finds necessary in carrying out its duties, unless the Governor shall otherwise provide.

(b) The board may apply for and receive grants from the federal government and from other sources.

(c) Other departments and agencies of state government shall cooperate with the board and make available to it data, facilities and personnel as may be needed to assist the board in carrying out its duties and functions.

Sec. 5 District environmental commissions

(a) For the purposes of the administration of this act, the state is divided into nine districts.

(1) District No. 1, comprising Franklin, Grand Isle and Lamoille Counties.

(2) District No. 2, comprising Orleans, Essex, and Caledonia Counties.

(3) District No. 3, comprising Chittenden County.

(4) District No. 4, comprising Addison County.

(5) District No. 5, comprising Washington and Orange Counties.

(6) District No. 6, comprising Rutland County.

(7) District No. 7, comprising Windham County.

(8) District No. 8, comprising Bennington County.

(9) District No. 9, comprising Windsor County.

(b) A district environmental commission is created for each district. Each district commission shall consist of three members from that district appointed in the month of February by the Governor so that two appointments expire in each odd numbered year. Two of the members shall be appointed for a term of four years, and the chairman (third member) of each district shall be appointed for a two year term.

(c) Members shall be removable for cause only, except the chairman who shall serve at the pleasure of the Governor.

(d) Any vacancy shall be filled by the Governor for the unexpired period of term.

Sec. 6 Permit for development and subdivision

No person shall sell or offer for sale any interest in any subdivision located in this state, or commence construction on a subdivision or development or commence development without a permit. This section shall not prohibit the sale, mortgage or transfer of all, or an undivided interest in all, of a subdivision unless the sale, mortgage or transfer is accomplished to circumvent the purposes of this act.

Sec. 7. Permits not required

Section 6 shall not apply to a subdivision exempt under the regulations of the department of health in effect on January 21, 1970 or any subdivision which has a permit issued prior to June 1, 1970 under the board of health regulations, or has pending a bona fide application for a permit under the regulations of the board of health on June 1, 1970, with respect to plats on file as of June 1, 1970 provided such permit is granted prior to August 1, 1970. Section 6 shall not apply to development which is not also a subdivision, which has been commenced prior to June 1, 1970, if the construction will be completed by March 1, 1971. Section 6 shall not apply to a state highway on which a hearing pursuant to section 222 of Title 19 has been held prior to June 1, 1970. Section 6 shall apply to any substantial change in such expected subdivision or development.

Sec. 8. Permit application

(a) An application for a permit shall be filed with the district commission as prescribed by the rules of the board and shall contain at least the following documents and information:

(1) The applicant's name, address, and the address of each of the applicant's offices in this state, and, where the applicant is not an individual, municipality or state agency, the form, date and place of formation of the applicant.

(2) Five copies of a plan of the proposed development or subdivision showing the intended use of the land, the proposed improvements, the details of the project and any other information required by this act, or the rules promulgated thereunder.

(3) The fee prescribed by rule.

(4) Certification of filing of notice as set forth in section 9.

Sec. 9. Notice of application

(a) On or before the date of filing of application the applicant shall send notice and a copy of the application to a municipality, and municipal and regional planning commissions wherein the land is located, and any adjacent Vermont municipality, municipal or regional planning commission if the land is located on a boundary. The applicant shall furnish to the district commission the names of those furnished notice by affidavit, and shall post a copy of the notice in the town clerk's office of the town or towns wherein the land lies.

(b) The district commission shall forward notice and a copy of the application to the board and any state agency directly affected, and any other municipality or state agency, or person the district commission or board deems appropriate. Notice shall also be published in a local newspaper generally circulating in the area where the land is located not more than 7 days after receipt of the application.

Sec. 10. Hearings

(a) Any one required to receive notice by section 9 and any adjoining property owner may request a hearing by filing a request within 15 days of receipt of notice. Upon receipt of notice the district commission shall treat the application pursuant to section 814 of Title 3. The district commission may order a hearing without a request within 20 days of receipt of the application.

(b) The date for a hearing shall be set within 25 days of receipt of the application or notice of appeal filed under section 14 (a). The hearing shall be held within 40 days of receipt of the application or notice of appeal. The parties shall be given not less than 10 days notice. Notice shall also be published in a local newspaper generally circulating in the area where the land is located not less than 10 days before the hearing date.

(c) Parties shall be those who have received notice, adjoining property owners who have requested a hearing, and such other persons as the board may allow by rule. For the purposes of appeal only the applicant, a state agency, the regional and municipal planning commissions and the municipalities required to receive notice shall be considered parties.

Sec. 11. Hearing not required

If no hearing has been requested or ordered within the prescribed period no hearing need be held by the district commission. In such an event a permit shall be granted or denied within 60 days of receipt; otherwise, it shall be deemed approved and a permit shall be issued.

Sec. 12. Denial of application

(a) No application shall be denied by the board or district commission unless it finds the proposed subdivision or development detrimental to the public health, safety or general welfare.

Before granting a permit the board or district commission shall find that the subdivision or development:

(1) Will not result in undue water or air pollution. In making this determination it shall at least consider: the elevation of land above sea level and in relation to the flood plains, the nature of soils and subsoils and their ability to adequately support waste disposal; the slope of the land and its effect on effluents; the availability of streams for disposal of effluents; and the applicable health and water resources department regulations.

(2) Does have sufficient water available for the reasonably foreseeable needs of the subdivision or development.

(3) Will not cause an unreasonable burden on an existing water supply, if one is to be utilized.

(4) Will not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result.

(5) Will not cause unreasonable highway congestion or unsafe conditions with respect to use of the highways existing or proposed.

(6) Will not cause an unreasonable burden on the ability of a municipality to provide educational services.

(7) Will not place an unreasonable burden on the ability of the local governments to provide municipal or governmental services.

(8) Will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites or rare and irreplaceable natural areas.

(9) Is in conformance with a duly adopted development plan, land use plan or land capability plan.

(10) Is in conformance with any duly adopted local or regional plan under chapter 91 of Title 24.

(b) The board or district commission shall issue its findings and decision within 20 days of the final hearing day.

(c) A permit may contain such requirements and conditions as are allowable within the proper exercise of the police power and which are appropriate with respect to (1) through (10) of subsection (a), including but not limited to those set forth in section 4407 (4), (8) and (9), 4411 (a) (2), 4415, 4416 and 4417 of Title 24, the dedication of lands for public use, and the filing of bonds to insure compliance. The requirements and conditions incorporated from Title 24 may be applied whether or not a local plan has been adopted. General requirements and conditions may be established by rule.

(d) A permit may not be denied solely for the reasons set forth in (5), (6) and (7) of subsection (a) above. However, reasonable conditions and requirements allowable in subsection (c) may be attached to alleviate the burdens created.

(e) A denial of a permit shall contain the specific reasons for denial. A person may, within 6 months, apply for reconsideration of his permit which application shall include an affidavit to the district commission and all parties of record that the deficiencies have been corrected. The district commission shall hold a new hearing upon 25 days notice to the parties. The hearing shall be held within 40 days of receipt of the request for reconsideration.

(f) The board may by rule allow the acceptance of a permit or permits or approval of any state agency with respect to (1) through (5) of subsection (a) or a permit or permits of a specified municipal government with respect to (1) through (7) and (10) of subsection (a), or a combination of such permits or approvals, in lieu of evidence by the applicant. The acceptance of such approval, permit or permits shall create a presumption that the application is not detrimental to the public health and welfare with respect to the specific requirement for which it is accepted. Such a rule may be revoked or amended pursuant to the procedures set forth in 3 V.S.A. Sec. 803 (b). The board shall not approve the acceptance of a permit or approval of such an agency or a permit of a municipal government unless it satisfies the appropriate requirements of subsection (a)of this section.

Sec. 13. Burden of proof

(a) The burden shall be on the applicant with respect to (1), (2), (3), (4), (9) and (10) of section 12 (a).

(b) The burden shall be on any party opposing the applicant with respect to (5) through (8) of section 12 (a) to show an unreasonable or adverse effect.

Sec. 14. Appeal

(a) An appeal from the district commission shall be to the board. The board shall hold a de novo hearing on all findings requested by any party. Notice of appeal shall be filed with the board within 30 days. The board shall notify the parties set forth in section 10 (c). The board shall proceed as in section 10 (b) and (c) and treat the applicant pursuant to section 814 of Title 3.

(b) An appeal from a decision of the board under subsection (a) shall be to the supreme court by a party as set forth in section 10 (c).

(c) No objection that has not been urged before the board may be considered by the court, unless the failure or neglect to urge such objection shall be excused because of extraordinary circumstances. The findings of the board with respect to questions of fact, if supported by substantial evidence on the record as a whole, shall be conclusive.

(d) An appeal from the board will be allowed for all usual reasons, including the unreasonableness or insufficiency of the conditions attached to a permit. An appeal from the district commission will be allowed for any reason except no appeal shall be allowed when an application has been granted and no preliminary hearing requested.

Sec. 15. Data and investigations

The board and district commission may conduct such investigations, examinations, tests and site evaluations as they deem necessary to verify information contained in the application. An applicant shall grant the board or district commission, or their agents, permission to enter upon his land for these purposes.

Sec. 16. Duration and revocation of permits

(a) Any permit granted under this act shall be for a specified period determined by the board in accordance with the rules adopted under this chapter as a reasonable projection of the time during which the land will remain suitable for use if developed or subdivided as contemplated in the application, and with due regard for the economic considerations attending the proposed development or subdivision.

(b) A permit may be revoked by the board in the event of violation of any conditions attached to any permit or the terms of any application, or violation of any rules of the board.

Sec. 17. Renewals and Nonuse

(a) At the expiration of each permit, it may be renewed under the same procedure herein specified for an original application.

(b) Nonuse of a permit for a period of one year following the date of issuance shall constitute an abandonment of the project and the permit shall be considered expired.

(c, If the application is made for an extension prior to expiration the district commission may grant an extension and may waive the necessity of a hearing.

Sec. 18. Interim land capability plan

Prior to the adoption of the capability and development plan, the board shall adopt an interim land capability and development plan which will describe the present use of the land and define in broad categories the capability of the land for development and use based on ecological considerations and which plan shall be in effect until the adoption of the land use plan, or until July 1, 1972, whichever first occurs.

Sec. 19. Capability and Development plan

The board shall adopt a capability and development plan consistent with the interim land capability plan which shall be made with the general purpose of guiding and accomplishing a coordinated, efficient and economic development of the state, which will, in accordance with present and future needs and resources, best promote the health, safety, order, convenience, prosperity and welfare of the inhabitants, as well as efficiency and economy in the process of development, including but not limited to, such distribution of population and of the uses of the land for urbanization, trade, industry, habitation, recreation, agriculture, forestry and other uses as will tend to create conditions favorable to transportation, health, safety, civic activities and educational and cultural opportunities, reduce the wastes of financial and human resources which result from either excessive congestion or excessive scattering of population and tend toward an efficient and economic utilization of drainage, sanitary and other facilities and resources and the conservation and production of the supply of food, water and minerals. In addition, the plan may accomplish the purposes set forth in section 4302 of Title 24.

Sec. 20. Land use plan

After the adoption of a capability and development plan, the board shall adopt a land use plan based on the capability and development plan which shall consist of a map and statements of present and prospective land uses based on the capability and development plan, which determine in broad categories the proper use of the lands in the state whether for forestry, recreation, agriculture or urban purposes, the plans to be further implemented at the local level by authorized land use controls such as subdivision regulations and zoning.

Sec. 21. Public hearings

(a) The board shall hold public hearings for the purpose of collecting information to be used in establishing the capability and development plan, land use plan, and interim land capability plan. The public hearings may be held in an appropriate area or areas of the state and shall be conducted according to rules to be established and published by the board.

(b) The board may, on its own motion or on petition of an interested agency of the state or any regional or local planning commission, hold such other hearings as it may deem necessary from time to time for the purpose of obtaining information necessary or helpful in the determination of its policies, the carrying out of its duties, or the formulation of its rules and regulations.

(c) At least one public hearing shall be held in each district prior to adoption of a plan pursuant to sections 19 and 20 of this act. Notice of a hearing shall be furnished each municipality, and municipal and regional planning commission, in the district where the hearing is to be held not less than fifteen days prior to the hearing.

(d) The provisions of chapter 25 of Title 3 shall not apply to the hearings under this section.

Sec. 22. Submission to municipal and regional planning commissions

Prior to approval of a plan by the board the tentative plan shall be submitted to each municipal and regional planning commission, which shall forward its comments and recommendations, if any, to the board within 30 days. The board shall, prior to approval of the plan, consider all such comments and recommendations, make such changes in the plan as it deems appropriate, and convey its specific responses to the respective planning commissions from which the comments and recommendations originated.

Sec. 23. Approval of governor and legislature

Upon approval of a capability and development, land use or interim land capability plan by the board, it shall submit the plan to the governor for approval. The governor shall approve the plan, or disapprove the plan or any portion of a plan, within 30 days of receipt. If the governor fails to act, the plan shall be deemed approved by the governor. This section and section 22 shall also apply to any amendment of a plan.

After approval by the governor, plans pursuant to section 19 and 20 shall be submitted to the general assembly when next in session for approval by joint resolution. A plan shall be considered adopted for the purposes of section 12 (a) (9) when the required final approval has been made.

Sec. 24. Amendments to boundaries

(a) After final adoption, any department or agency of the state or a municipality, or any property owner or lessee may petition the board for a change in the boundary of any district created under section 20 or the capability of land for a use under section 18. Within 10 days of receipt, the board shall forward a copy of the petition to the district commission and regional planning agency for comments and recommendations. If no regional planning commission exists, the copy shall be sent to the affected municipal planning commissions and municipalities.

(b) After 60 days but within 120 days of the original receipt of a petition, the board shall advertise a public hearing to be held in the appropriate county. The board shall notify the persons and agencies that have an interest in the change of the time and place of the hearing.

(c) With respect to petitions relating to section 20 no change shall be approved unless the petitioner has submitted proof that the area is needed for a use other than that for which the district in which it is situated is classified, and the following requirements have been fulfilled:

(1) The petitioner has submitted proof that the land is usable and adaptable for the use for which it is proposed to be classified, and

(2) Conditions and trends of development have so changed since the adoption of the present classification, that the proposed classification is reasonable.

(d) With respect to petitions relating to section 18 no change shall be allowed unless the land is capable of sustaining the use proposed.

(e) The applicant, any person or municipality directly affected, who is aggrieved may appeal to the supreme court as in 14 (c).

Sec. 25. Additional powers

(a) The board shall adopt rules to interpret and carry out the provisions of this act.

(b) The board and district commissions shall have the power to compel the attendance of witnesses, and require the production of evidence.

(c) The powers granted to the board under this act are additional to any other powers which may be granted to it by other legislation.

(d) The board may designate or establish such regional offices as it deems necessary to implement the provisions of this act and the rules adopted hereunder. The board may designate or require a regional planning commission to receive applications, provide administrative assistance, investigations, and make recommendations.

(e) The board, when it determines the workload in any district is such that unreasonable delays will result, may at the request of an overloaded district authorize the district commission of another district to sit in that district to consider applications.

(f) The board may by rule allow joint hearings to be conducted with specified state agencies or specified municipalities.

Sec.26. Procedures

The provisions of chapter 25 of Title 3 shall apply unless otherwise specifically stated.

Sec. 27. Approval by local governments and state agencies

The permit required under section 6 shall not supersede or replace the requirements for a permit of any other state agency or municipal government.

Sec. 28. Penalty for violation

A violation of any provision of this act or the rules promulgated hereunder is punishable by a fine of not more than $500.00 for each day of the violation or imprisonment for not more than two years, or both.

Sec. 29. Enforcement, conveyances invalid for establishing title

In addition to the other penalties herein provided, the board may, in the name of the state of Vermont, institute any appropriate action, injunction, or other proceeding to prevent, restrain, correct or abate any violation hereof or of the rules promulgated hereunder.

Sec. 30. 32 V.S.A. Sec. 3378 is amended to read as follows:

Section 3378. Prohibition against certain recordings

No town clerk shall record, or receive for recording, any deed to which has not been affixed an acknowledgement of return and tax payment under Sec. 3377 of this Title and a certificate in the form prescribed by the environmental board signed under oath by the seller, that the conveyance of the real property and any development thereon by the seller is in compliance with or exempt from the provisions of this act. A town clerk who violates this section shall be fined $50.00 for the first such offense and $100.00 for each subsequent offense.

A person who purposely or knowingly falsifies any statement contained in the certificate required is punishable by fine of not more than $500.00 or imprisonment for not more than one year.

Sec. 31. Members of the board and district commissions shall receive a per diem pay of $25.00 and all necessary expenses.

Sec. 32. Temporary provisions

(a) On or before June 1, 1970, the governor shall appoint four members to the board whose terms shall expire January 31, 1971, four members whose terms shall expire January 31, 1973, and a chairman whose term shall expire January 31, 1971.

(b) On or before June 1, 1970, the governor shall appoint one member of each district commission whose term shall expire January 31, 1971, one member whose term shall expire January 31, 1973, and a chairman whose term shall expire January 31, 1971.

(c) The appointments to the board shall be made with the advice and consent of the senate for all appointments made during the present session of the legislature, and for all appointments, not so made, whose terms expire in 1973, by the senate of the general assembly convening January, 1971.

Sec. 33. Separability

If any provision of this act, or the application of such provision to any person or circumstances, shall be held invalid, the remainder of this act, or the application of that provision to persons or circumstances other than those as to which it is held invalid, shall not be affected thereby.

Sec. 34. There is hereby appropriated to the executive office the sum of $30,000.00 for the purposes of this act. These funds shall not revert but may be used until June 30, 1971.

Sec. 35. Section 6 shall take effect on June 1, 1970. All other sections shall take effect from passage.